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RESE

Standardization



Can Standard Tests Tell "Use Value" of Textiles?

articles on pages 269 and 274

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Some 2000 industrial concerns hold membership either directly or by group arrangement through their respective trade associations

Can Nationally Accepted Safety Codes Become State Law?

Special Commission To Draft Codes and Rules for Safety and Health for Places of Employment, Rhode Island

Gentlemen: At the last session of the General Assembly a resolution was passed creating a Special Commission to study the matter of Industrial Safety and Health Codes and Rules. A Commission was duly appointed to draft such codes and rules, and to submit them, together with the necessary legislation to the next session of the General Assembly.

The basic code-making law which we are preparing for the Commission seeks to incorporate by reference nationally accepted safety codes of such engineering bodies as your own, the American Association of Mechanical Engineers, etc. In searching the legal authority on the question of illegal delegation of power by the legislature, we find in "Sutherland's Statutory Construction" third edition, Hoback, under *Delegation to Private Persons*, note 5, which reads as follows:

"See for example the widespread state adoption of the National Formulary and the U. S. Pharmacopeia as standards for pure food and drug legislation, and the Uniform Classification of Accounts of the National Association of Railway and Utility Commissioners, the National Electrical Safety Code, the regulations of the National Board of Fire Underwriters, etc."

The Commission would greatly appreciate your apprising us of the latest status of the decisions on this question of the delegation of legislative powers.

ROBERT M. MURRAY, Chief Division of Industrial Inspection

• • Cyril Ainsworth, assistant secretary of the American Standards Association, replied:

The National Electrical Safety Code is an American Standard approved by the American Standards Association. It has been uniformly used by state regulation bodies such as Departments of Labor and Industrial Accident Commissions as the basis of their requirements in regard to the safe use of electrical utilization equipment.

This is only one of a considerable number of safety codes which have been approved by ASA as American Standards and used by regulatory bodies. In most cases regulatory bodies have used the document exactly as approved by ASA. This is probably due to the fact that many of the regulatory bodies do not have the technical experience in their staffs to develop specific requirements of their own and recognizing the superiority of the technical knowledge of those who developed the Safety Electrical Code they have taken the document exactly as written.

During the time that I served on the staff of the Pennsylvania Department of Labor and Industry, I found that this question of the legality of delegating rule making power was constantly arising within the department. On several occasions the department requested the Attorney General's Office for an opinion on the matter. In each case the Attorney General's Department ruled that the Department of Labor need have no worry concerning the constitutionality of its rule making power so long as the rules which are promulgated were reasonable. This was supported by an opinion written by a constitutional lawyer who represented a large number of prominent industries of the state.

The opinion completely supported the rulings of the Attorney General's Office and stated that so long as any regulations developed by the Department of Labor were reasonable and did not work an undue hardship that no complaint would be carried to the courts on the constitutionality of the rule making power.

I am enclosing a print of a safety law which was developed by a committee within the ASA which supervises our Safety Standardization Work. It was developed many years ago to meet a number of requests received from state regulatory bodies who were considering legislation designed to give them rule making power. The chairman of the Drafting Committee, through personal contact, was able to present this draft law to a committee of the American Bar Association and the draft was approved by it. No question was raised by this committee concerning the constitutionality of such a law.

If the situation is examined from the point of view of the country as a whole, I think it might be safely said that the experience of the constitutionality of such rule making power is on an unwritten law basis. The principle has been so widely applied through all phases of Federal, State, and Municipal Governmental operations that the question is very seldom raised. Because a very great number of regulatory bodies have, under the power granted to them by legislatures, developed rules and regulations and have put them into effect with full force and effect of law, and have continued to do this over so extensive a period of years, it can be safely assumed that the constitutionality of such procedures must be generally recognized.

Our Front Cover

This picture, taken in a textile mill, shows the yarn on spools ready for weaving. For a discussion of the problem of satisfactory tests of textiles and textile products, see pages 269 and 274. Other pictures of textile tests and manufacture are on pages 272 and 273.

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Contents

Associations and Government—

New Directory of Commodity Specifications.....	268
ASTM Announces Date for 49th Annual Meeting.....	271
ASME Honors Moss, Durand and Juran.....	275
Welding Research Council Names Spragren Director.....	275
New Standards in ASA Library.....	282
NBS Acts on Standards and Simplified Practice Recommendations.....	284
Reprint Tells Story of Underwriters Laboratories.....	285

Building—

New Jersey Association Hears Address on Building Codes.....	268
New ASTM Committee Proposed on Methods of Testing Building Materials	286

Consumer—

ASA Committee Takes First Step for Low Cost Clothing Standards.....	267
Association Sets Coffee Standards.....	268
Textile Testing for the Consumer. By Irwin D. Wolf.....	269
Uniform Bedding Laws Studied by Manufacturers.....	274
Tomorrow's Textiles—Yesterday's Tests. By J. B. Goldberg.....	274
Aid for Selection of Harmonious Colors.....	275

Electrical—

Electrical Committees Report—1945.....	278
--	-----

International—

Palestine Standards Institution Reports on Testing Program.....	265
Reck Helps Chinese in Study of U. S. Standards.....	266
ASA Translates Argentine Electrical Standard.....	266
Foreign Trade Convention Endorses Standardization.....	269
Chile Gives Institute Recognition as National Standards Association.....	276
South African Government Sets Up Bureau of Standards.....	277

Mechanical—

War Standard on Screw Threads Converted to American Standard.....	276
Ship Standards Made Parts Transfer Easy.....	276

Photography—

ASA Motion Picture Committee Reorganized for Postwar Program.....	266
Motion Picture Engineers Sponsor Peacetime Work on Standards.....	276

Safety—

How to Assure Safe Elevator Operation. By G. H. Reppert.....	261
Rhode Island Considers Transmission Apparatus Safety Code.....	266
Cause and Cure	268
When American Standard Safety Requirements Are Not Followed.....	277

American Standards Association—

ASA Standards Activities—

American Standards	285
American War Standards	285
News About ASA Projects	286
New Standards Available.....	287

Personnel—

Scientific Apparatus Makers Becomes Most Recent Member-Body of ASA	265
Singstad Retires from New York Tunnel Authority.....	269

The Pictures—Cover—Keystone View Co; Frontispiece—Charles Phelps Cushing; 262—Otis Elevator Co; 272, 273—Keystone View Co; 277—Press Assn; 278—General Electric; 280—Westinghouse; Back Cover—General Electric.

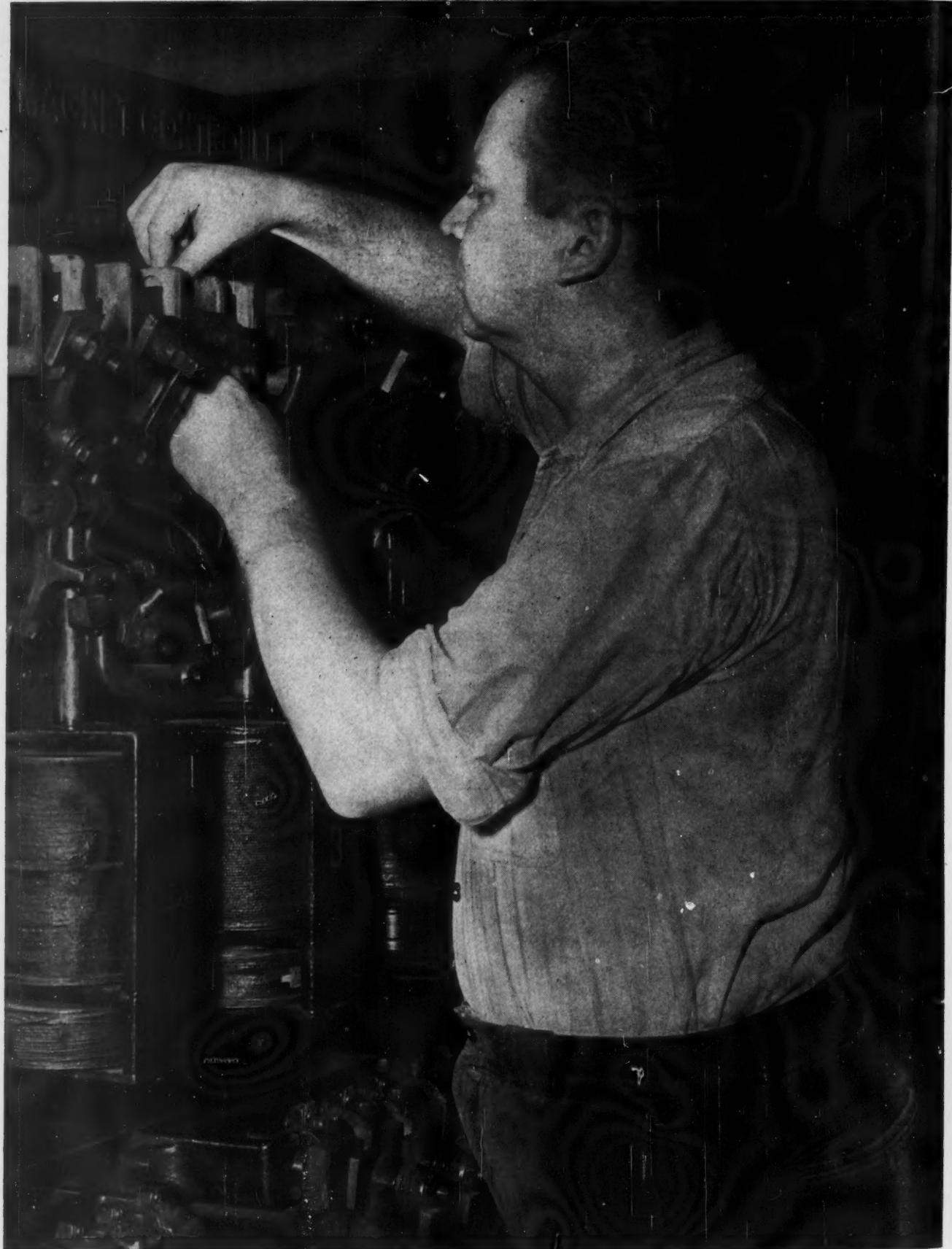
December, 1945

Ruth E. Mason, Editor

35 Cents

Standardization is dynamic, not static. It means not to stand still, but to move forward together.

Subscription price \$4.00 per year (foreign \$5.00). Special to schools and libraries \$2.00 (foreign \$3.00). Re-entered as 2nd Class Matter 7/31/43, at the Post Office, New York, N.Y., Act of March 3, 1879.



Inspection according to nationally acceptable standards is important in maintaining elevators in safe condition. Here a maintenance man is inspecting the magnet controller of a passenger elevator in a New York office building.

How to Assure Safe Elevator Operation

By G. H. Reppert

A clear understanding of standard essentials of elevator mechanism and installation, and meticulous inspection according to standard methods are needed for safety in elevator operation

SAFE elevator operation depends on three things:

- (1) The correct installation of properly designed equipment with adequate safety devices;
- (2) The periodic inspection of such equipment; and
- (3) The proper maintenance of the equipment.

Properly Designed and Installed Equipment with Adequate Safety Devices

To determine what is necessary to make any particular elevator safe, a survey must first be made of that elevator to find out what its equipment consists of. This is entirely aside from the physical condition of its various parts.

Having made a survey and determined what equipment has been provided we must then compare this with some standard to determine whether we have a safe elevator.

The next question we must decide, therefore, is with what standard shall it be compared. An obvious answer is, "with the city or state elevator code effective in its place of installation". This may or may not be a satisfactory standard depending on how effective the code may be from a safety standpoint. As a matter of fact there are a limited number of city and state elevator codes which can be considered adequate from a safety standpoint. A considerable number of such codes, when they even exist, are out of date and most unsatisfactory from a safety standpoint. In most cases these codes do not even attempt to set up standards from which a comparison can be made, and in others they are so brief that they are practically use-

less. In a large number of cities and states no code or regulations exist at all.

As an illustration of the inadequacy of a state code for use as a criterion for safe equipment, there

G. H. Reppert, Electrical Engineer, Otis Elevator Company, represents the American Institute of Electrical Engineers on the ASA Sectional Committee on Safety Code for Elevators, Dumbwaiters and Escalators, A17. Here, Mr. Reppert describes in some detail how the American Standard safety code and the new edition of the American Standard Practice for the Inspection of Elevators (Inspectors' Manual) help in determining whether your elevator is accident-proof.

is a code in one of the original 13 states (which prides itself on industrial safety standards) which permits using a single-bar hoistway landing gate 40 in. high; requires no interlocks or even hoistway-door electric contacts on hoistway gates or doors and no hoistway-door interlocks for automatic or continuous-pressure-operation elevator; requires no car gates, even on passenger elevators; and requires no car-gate electric contacts to insure that the gate must be closed before the car can be operated. Any attempt to use this state code as a criterion of safety is useless.

In another respect, state and city codes, where they exist, and even where adequate from a safety standpoint, are not satisfactory due to the fact that in practically all cases the safety requirements apply only to

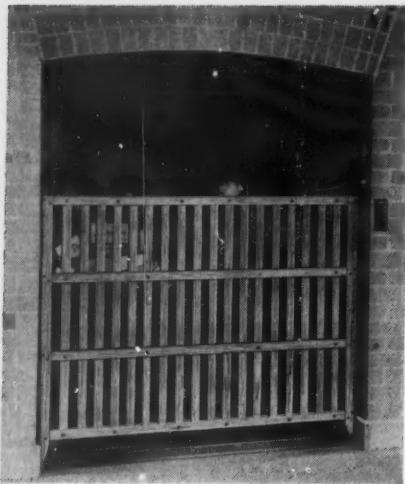
new elevators. If applied to existing elevators they are only applied to a very limited extent. This situation, while regrettable, is an economic one and is intensified by the long life of elevator equipment. While no exact figures are available, it is safe to say that 90 percent of all elevators are over 10 years old and roughly about 50 percent are 20 years or older.

It is the old elevators on which the greatest hazards exist, because, on those built in the last 20 years and to a lesser extent on those built in the last 25 to 30 years, the standards of safety have been materially greater due to the fact that elevator manufacturers have become safety conscious to a greater degree and have installed safer equipment than most of the city and state codes have required. In general, it is reasonable to assume that there is a higher percentage of old elevators of the freight type in use than of those of the passenger type. The mileage of the former is less than the latter and there is not the same economic inducement to modernize and make safe that there is in the case of passenger elevators where the occupancy of the building depends on good and safe elevator service.

What Is a Standard for Safe Elevators?

If, then, we cannot depend on city and state elevator codes for our standard as to what a safe elevator is, where shall we find such a standard? Is there a standard compiled by a responsible body which is interested in the subject only from the standpoint of safety, and what is the name of this body? It seems to me that there is only one answer. The best disinterested responsible body, for which we are looking, is the American Standards Association, with whose work you are all familiar. The standard is the American Standard Safety Code for Elevators, Dumbwaiters, and Escalators.¹

¹ This standard was developed by a representative committee of the American Standards Association working under the sponsorship of the American Institute of Architects; the American Society of Mechanical Engineers; and the National Bureau of Standards.



Left:—Old type of freight elevator with open wooden gate. Equipped with push button, this is not as hazardous as the older type with rope pulley.

Right:—The new type of freight elevator is completely enclosed. To insure safety, the release of the door lock latch or hook must mechanically force open the electric contact to prevent the operation of the elevator. It must be designed to prevent the door from opening when the elevator is in operation.



In applying any standard of this type to existing equipment it is necessary to be reasonable and the matter cannot be settled by saying: "Oh, yes, if you want your elevator safe just make it comply with all the requirements of the American Standard Elevator Code."

This has been tried by several cities and some states and has unfortunately failed. You cannot do it on account of the cost and because, in many cases, you will find that by the time you are through you have installed a completely new elevator at a cost, including building alterations, that would exceed a new elevator in a new building.

It is necessary, therefore, to make a study of the American Standard Elevator Code and determine which of the safety requirements our elevator does not meet. Then it must be determined which of these are the most important from a safety standpoint, and which can be done for a reasonable cost, commensurate with the increased safety secured.

Accident records indicate that approximately 85 percent of all accidents occur at or adjacent to the landing openings and it is a fact that safety protection at these openings can, in most cases, be secured for a reasonable expenditure.

For many years it was the practice to install freight elevators controlled by hand-operated shipper cables and to install wooden gates, usually inadequate in design and construction, at the openings. These gates were low enough so that persons on the landings could reach over the gates and operate the elevator by pulling on the hand rope and then, as the car passed, opening the gate and jumping on the car. This was done because in effect it

provided an elevator which did not require the use of a regular operator, with a corresponding decrease in expense of operation. This obviously is hazardous, as the employees must lean over the gates and look up or down the hoistway to locate the elevator, then reach over the gate to pull the rope and then, as the car passes, jump on the moving car. This procedure has resulted in a high percentage of accidents. The hazard can be eliminated, usually at a reasonable expense, by replacing the hand-rope control with up and down push button or continuous-pressure operation from the car and landing, and replacing the gates with gates of height and of a design which will adequately protect the opening.

Design Hoistway Gates for Safety

Upon referring to the American Standard Elevator Code you will find that it requires that hoistway gates, where used, shall extend the full height of the opening. This will probably be found impracticable in a great many cases on existing elevators due to physical limitations and to cost. When this is the case, a very great increase in safety can be obtained by making such gates 5 ft 6 in. to 6 ft 0 in. high, of such a design that they will reject a 2 in. ball and with the lower bar of gate extending to the floor to prevent objects being pushed through or under the gate. In all such cases, mechanical gate locks and hoistway gate electric contacts or interlocks should be provided as required by the code. Semi- and full-automatic gates are hazardous and should be done away with if adequate safety is desired. Where such gates are used, the car always starts with the gate open and the motion of the car leaving the

floor is supposed to close the gates. It seems unnecessary to enumerate the hazards resulting from such an operation.

Car tops and car gates are a desirable requisite from a safety standpoint, probably more so on passenger than on freight elevators. In this connection it should be noted that the addition of these safeguards on existing elevators, while most desirable, must be done with due caution. Any weight added to the car reduces its lifting capacity, unless there is a corresponding increase in the weight of the counterweight, and the increase of these weights directly affects the load on the elevator machine, the cables, and the load on the overhead supports. Any increase in the weight of the car also affects the car safety device which must be capable of stopping the increased weight of the car.

In many cases the machine installed by the manufacturer has been loaded to its maximum safe capacity allowing, of course, for a reasonable factor of safety which varies with different manufacturers. It is strongly recommended that wherever it is planned to add weight of an appreciable amount to an elevator car, the original manufacturer, or, if he is not available, some other reputable elevator manufacturer be consulted, before doing so.

Hoistway doors are, of course, far safer than gates as they are more substantial and they cover the entire opening. They are also less costly to maintain. For these reasons their installation on existing elevators where possible is recommended. Needless to say they should be provided with mechanical locks and contacts or interlocks as required by the code.

The door-locking and car-gate equipment of elevators of the momentary or continuous-pressure push button type where the car can be operated from the landings is extremely important. It is strongly recommended that the requirements of the American Standard Elevator Code as given in rules 120, 121, and 124 be carefully noted. Many persons are confused as to the meaning of the term "interlock" and think that a device which closes a contact when a hoistway door or gate is closed, and locks the door or gate *after* the car has left the landing, is an interlock. This is incorrect. The term "interlock" as used in the American Standard Elevator Code is based on the holding open of the operating circuit unless and until the hoistway door is closed and locked, thus preventing the starting of the car unless the hoistway door has first been securely locked. To determine whether the device on an elevator is an interlock or not (for many devices of this kind which have been installed under that name are not interlocks), block the door lock latch or hook open with the door closed and see if the elevator car will start; if it does, the device is not an interlock.

A great many so-called electric hoistway door and car gate contacts are improperly designed in that they depend solely on gravity or a spring or a combination of these to open the contact when the door or gate is opened. Such devices are unsafe as the contacts frequently fail to open when the door or gate is opened and thus fail to provide the protection for which they are intended.

To insure proper safety the contact must be designed so that when the door or gate is opened the electric contact is forced open by the movement of the door or gate. This feature is also essential in the case of door interlocks, except that in this case the release of the door lock latch or hook must mechanically force open the electric contact or, if it fails to do so, prevent the release of the locking members. Both of these features are readily detected by anyone who cares to investigate these devices for himself, and if you are interested in safety it is suggested that you try them.

Antiquated Equipment Unsafe

There is a considerable amount of antiquated equipment in use which is definitely unsafe and which should

be replaced. In this class, I would include wood car frames, many of which had the car safety located in the car crosshead, and platform frames of wood. In many cases these were improperly designed to begin with and even where properly designed they have, in many cases, deteriorated due to dry rot. An accident recently occurred on such an elevator where one of the wooden side stiles of the car frame pulled loose from the crosshead, and broke the other stile, and the platform and load fell to the bottom of the pit. It is recommended that wood car and platform frames be replaced with steel.

While the use of the traction type machine has increased the safety of elevators to a very marked degree, this applies only when the traction machine is properly designed. In the case of the double wrap traction elevator, the use of a U-shaped groove is general, and if the machine fails to stop when the car reaches the terminals, the resulting loss in traction when the car or counterweight lands on the buffers prevents the counterweight or car from being pulled into the overhead thus preventing the type of accident which frequently occurs with the drum type machine.

In the case of the single-wrap geared traction machine, which has become universal and has practically eliminated the use of the general drum machine for moderate car speeds, the type of groove used in the driving sheave is, from the standpoint of safety, of great importance. The use of an ordinary V-groove, where the traction is the result of the pinching of the rope in the groove is, in general, undesirable and should be avoided where possible. Where improperly used, it frequently results, when the installation is new, in excessive traction so that the car or counterweight may be drawn into the overhead work. As the installation is used, the wear of the grooves frequently results in insufficient traction so that not only may the car not lift its contract load but may run away with a load less than contract load as a result of the cables slipping in the grooves.

Two accidents occurred recently due to this cause, resulting in injury to a number of passengers.

The groove, where possible, should be of the undercut type so that wear does not affect the traction before the cable has reached the bottom of the undercut. This latter condition can easily be determined by inspection.

Existing single wrap machines with straight V grooves should, where possible, be re-grooved with undercut grooves. Where sufficient metal is not available for this, new sheave rims or new sheaves with undercut grooves should be installed. In every such case the original manufacturer, or, if this is not possible, a reliable elevator manufacturer should be consulted before this is done.

In some cases, where the weight of the car is very light in relation to the load, or the angle of wrap of the cables on the sheave is too small, or both, sufficient traction cannot be obtained by the round undercut groove. In such cases if the service is intermittent, it may be permissible and even necessary to use a V groove. With this type of groove very little wear of the groove is permissible before slipping will occur; therefore closer inspection is necessary.

Periodic Inspection of Elevators Essential

Frequent, periodic, and careful inspections are prime requisites for safe elevator operation. While city and state elevator inspectors and insurance companies make such inspections, it should be realized that these inspections are limited to their own particular interests and therefore to secure safe elevator operation they should be supplemented by more frequent inspection by the owners' employees or, preferably, by a reputable and responsible elevator company.

The subject of the inspection of elevators is fully and completely covered by *Safe Practices Pamphlet 15*, published by the National Safety Council, Inc., and by the American Recommended Practice for the Inspection of Elevators, A17.2, approved by the American Standards Association. The latter has just been revised by the ASA Sectional Committee on the Safety Code for Elevators, Dumbwaiters, and Escalators, and has had a considerable amount of new material added in the appendix. This includes: Enlarged table of clearances, with charts for measuring and checking overhead and pit clearances; table of governor tripping speeds and buffer stroke for various contact speeds; illustrations showing various types of wire rope construction; description and schematic layout of various types of under car safeties and governors; and handling and socketing of wire rope. The new edition is now in the

process of being printed and copies may be secured in the near future.² It is strongly recommended that anyone interested in the subject of elevator safety and inspection secure and familiarize himself with these two publications.

Maintenance of Elevators Eliminates Defects

Having been inspected, the elevator cannot be made safe until the defects exposed by the inspection have been corrected. This should be done immediately following each inspection and not allowed to wait until a convenient time, which usually never arrives.

Some of the more important items of maintenance, possibly not generally realized, are the following:

Some owners of elevators feel that they can obtain longer life with a corresponding decrease in maintenance cost by replacing existing 6/19 iron governor ropes with 8/19 iron or steel governor ropes. This may be in the interest of economy, but it may not be in the interest of safety as many governors, unless altered, will not function properly with the 8 x 19 rope. For safety's sake I advise you to consult the original manufacturer of your elevator if you are thinking of such a change and make sure that it can be done safely.

Iron governor cables frequently fail owing to fatigue of the wires before they show any broken wires on the outside, apparently owing to the fact that the cable tends to pre-form itself in service. This condition, so far as the speaker knows, can only be determined by bending the cable by hand at various points throughout its length. If badly fatigued, the outside wires will break and spring out from the body of the cable, clearly indicating its condition.

There is, in connection with drum type machines, a tendency for the hoist cables to break at the cable sockets due to fatigue of the wires caused by the whipping of the cables. This is more likely to occur in the case of overhead machines than in the case of machines mounted below, but the tendency exists in all cases. The breaking of the cables from this cause can only be prevented by cutting them off near the socket and resocketing them at regular periodic intervals. It is recommended that this be done at least once every year. Detection of the broken wires by inspection is usually very difficult as the breakage occurs just below the top of the socket where it cannot easily be seen.

Many persons do not realize the importance of regular maintenance of the car guide shoes and allow these shoes to wear until the safety jaws or blocks ride against the guide rails.

In order to cause application of the car safety as quickly as possible after the governor trips, particularly in the case of broken ropes resulting in a free fall of the car, it has been the general practice of all elevator manufacturers to pro-

vide a very small clearance between the safety shoes or block and the guide rail. The American Standard Elevator Code permits a clearance as small as 3/64 in. on each side of the rail. This only leaves a margin of 1/32 in. on each side for wear before the safety shoes or blocks touch the rail, and from this point the guiding of the car is entirely by the latter with resulting rapid wear. The wearing away of the safety shoes in the case of sliding type safeties, such as the familiar wedge clamp, increases the amount of safety rope which must be pulled off the safety drum to apply pressure between the safety jaws and the rail. In a short time this may result in failure of the safety to operate owing to the fact that there is an insufficient number of turns of rope on the drum. The usual practice is to provide three extra turns on the safety drum to allow for a reasonable amount of wear. Only recently, an examination of the car safety devices on the passenger elevators of one of the largest and tallest office buildings in this country showed that owing to wear of the safety shoes not one safety would have applied sufficient force to the rail to stop the car had it been called upon to act. This condition occurred in a building having its own maintenance crew and where regular inspections were made; so that it very clearly takes more than ordinary inspection to detect abnormal wear of vital parts of the equipment and to insure safety.

In the case of instantaneous safeties of the wedge or roll type the same situation exists and the importance of proper maintenance of the guide shoes cannot be too greatly stressed. The same conditions occur of course where the guide-shoes fastenings are allowed to become loose and I have seen the result of an accident when a garage elevator together with two men and an automobile fell to the pit due to this condition. An examination showed the safety block cut away by running against the rail so that when the governor acted the safety roller did not even touch the rail.

Driving sheaves of single-wrap traction machines should be regrooved whenever excessive wear of the grooves has occurred. This is especially important in the case of the V-type groove which wherever possible, when excessive wear has occurred, should be regrooved with the undercut type of groove. This not only increases the safety of the elevator but prolongs the cable life. Before changing from one type of groove to another, the manufacturer of the elevator should be consulted, as in some cases the V-type groove is required in order to secure the necessary traction, this being dependent on the weight of the car, the counterweight, the live load, and the angle of wrap of the cables.

Attention is also called to the following circulars on elevator maintenance prepared by the Executive Committee for the American Standard Safety Code for Elevators, Dumbwaiters and Escalators and issued by the National Bureau of Standards:

Elevator Wire Rope Maintenance Circular C441

Maintenance of Elevator Mechanical Safety Appliances Circular C442
Maintenance of Elevator Hoistway and Car Enclosures and Equipment Circular C443
Maintenance of Elevator Hoistway Machines Circular C444

These circulars can be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., for five cents a copy.

New Developments in the Elevator Field

It is too soon after the ending of hostilities for the elevator manufacturers to have had an opportunity to put on the market new devices, but we can be assured, I believe, that within the next two or three years many new and improved features in connection with elevators will appear. Many of them are no doubt well under way by now in spite of the fact that practically all elevator manufacturers have been engaged 100 percent in war contract work.

It might be interesting to discuss briefly one device which, although not new, as it first came on the market about 25 years ago for heavy-duty low-speed freight elevators, has been developed within the last few years for high speed passenger elevators. This device is an under-car safety of the sliding type called the "Flexible Guide Clamp Safety". Those interested in a detailed description will find it in Appendix 5 of the new revised American Recommended Practice for the Inspection of Elevators previously referred to. Two points in connection with this type of safety are: First, its constant retarding force; and, second, the greatly decreased time required to bring the safety into action after the governor trips and clamps the governor rope. In fact, with one type of flexible guide-clamp safety the time required to bring the safety into action on the rails is not much greater than in the case of the instantaneous Roll Type Safety.

This shortening of the time of application is important not only in case the safety applies with the ropes intact as a result of a runaway condition but especially in the case of free fall of the car due to broken ropes. The greater the time that elapses after the car has reached the governor tripping speed and until the safety jaws begin to apply pressure to the rails and slow down the car the higher will be the speed reached by the car before the safety

² EDITOR'S NOTE. A more detailed discussion of the new edition of this standard will be published in a forthcoming issue of INDUSTRIAL STANDARDIZATION.

begins to slow it down and therefore the greater will be the distance required to bring it to a stop.

Conclusion

The points which seem to me to be among the most important factors bearing on the safety of elevators other than inspection are as follows:

1. Survey each elevator and note the equipment provided.
2. Compare the existing equipment with that required by the American Standard Elevator Code and list the parts of the equipment which deviate therefrom.
3. Determine which of the deviations appear to be the most likely to cause accidents and the probable cost of making such parts conform to, or as nearly as possible to, the American Standard Elevator Code requirements within economic limits commensurate with the additional safety secured.
4. Since the large majority of elevator accidents occur at or adjacent to the landings, and since further increased safety at this point can generally be secured for a reasonable amount, start at this point and install adequate gates and doors with the needed interlocks or locks and contacts.

5. Eliminate gates of the single bar type and automatic or semi-automatic gates.
6. As hand rope elevators, when used without a regular operator, are extremely dangerous, either place regular operators on such cars or change the operation to automatic or continuous pressure with the safeguards required for such elevators by the American Standard Elevator Code.
7. While car tops and car gates are most desirable from a safety standpoint, make sure before adding them to an existing elevator that they will not overload the elevator machinery or the overhead supports for same. This applies when any appreciable weight is added to an existing elevator car.
8. Make sure your door interlocks or your mechanical door locks and contacts and your car gate contacts are properly designed and installed as required by the American Standard Elevator Code. You may be surprised at what you find. Where the code requires an interlock make sure you have one and not a mechanical lock and contact.
9. Wood car frames and platform frames made of wood are inherently dangerous due to the likelihood of dry rot and this condition is difficult to detect by inspection. Replace all such with metal frames.
10. Watch your hoist ropes and your governor ropes and test them frequently.

In the case of drum machines, resocket your cables regularly once a year and keep a record of each elevator. Don't install a governor rope of a different type or construction without finding out from a reliable elevator manufacturer, and if possible from the one who installed the original equipment, whether the safety governor will operate properly with the new design rope.

11. Watch out for excessive play in the car guide shoes or loose shoes which permit the safety blocks to run against the rail and result in failure of the car safety to stop the car. A periodic test of the car safety yearly or oftener is a most reliable safeguard to prove the condition of such devices. This test should be made with as near contract load as possible but can be made at rated speed tripping the governor by hand. Even with no load such tests are most valuable as an indication of the condition of the safety.

12. Make sure that the driving sheave grooves on traction-type machines are properly designed and not worn excessively. This is extremely important on the single-wrap traction type of machine. Test the traction periodically by loading the car up to its rated capacity, both for lifting the load from rest and for stopping the load from speed.

Scientific Apparatus Makers Association Becomes Most Recent Member-Body of ASA

The American Standards Association welcomes the Scientific Apparatus Makers of America as an ASA Member-Body.

This association was organized in 1918 with the object of promoting the manufacture of scientific instruments in the United States. To cover the diversity of products included in its program it is divided into six sections: industrial instruments, laboratory instruments and apparatus, laboratory equipment, optical instruments, nautical, aeronautical, and military instruments, and recording and controlling instruments.

Programs of standardization for these sections have been sponsored by the National Bureau of Standards, American Chemical Society, American Physical Society, and the American Society for Testing Materials. Members have also participated in programs of the American Standards Association.

Officers of the Scientific Apparatus Makers Association include: J. A. Hartley, Braun Corporation, chairman of the Board; J. M. Roberts, Chicago, president; C. G. Campbell, Keweenaw Manufacturing Company, treasurer; and I. Stampen, secretary.

of physical constants, and moisture-density relations.

The Institution tests cement in accordance with the British Standard Specification for Portland cement.

The method of test of the American Society for Testing Materials was used for the water absorption test on concrete pipe; and the British Standard method was used for testing external pressure.

Sand-lime bricks are tested at the Institution according to British Standards after 24 hours immersion in water.

The first meeting of the Standards Committee of the Standards Institution of Palestine was held June 27, and elected Professor E. Goldberg (representing the Association of Engineers and Architects) chairman of the committee, and Dr. H. Heimann (representing the Hebrew Technical College, Haifa) as vice chairman.

During a visit to England, C. Wilson Brown, president of the Institution, established contact with the British Standards Institution and the Codes of Practice Committee of the Ministry of Works, and as a result collaboration between the two organizations is being studied.

In the United States, the Institution has been in touch with the United Nations Standards Coordinating Committee, the National Bureau of Standards, the American Society for Testing Materials, and the American Standards Association.

Palestine Standards Institution Reports on Testing Program

Two issues of the Bulletin of the Standards Institution of Palestine have now been received by the American Standards Association in exchange for ASA publications. The Bulletin is published with the Journal of the Association of Engineers and Architects in Palestine.

A review of the work already undertaken is given in the September issue of the Bulletin, the second to be issued. Results of tests, short

descriptions of testing methods, and standard definitions are included.

Subjects covered are: Subgrade soil; cement and concrete; concrete products; miscellaneous building materials; metals; water works and pumps; heating and cooking appliances; rubber and plastics; water; foodstuffs, fodder and fertilizers; and chemical products.

Soil investigations are carried out at the Institution in accordance with methods adopted in the United States, it is reported. Soils are classified in accordance with the results of fundamental tests such as mechanical analysis, determination

ASA Motion Picture Committee Reorganized for Postwar Program

C. R. Keith of the Western Electric Company, New York, was elected chairman of the Sectional Committee on Motion Pictures, Z22, of the American Standards Association at a recent meeting of the committee. Dr. A. N. Goldsmith, Consulting Engineer, New York, was elected honorary chairman, and



C. R. Keith

W. H. Deacy, of the ASA staff was appointed secretary of the committee. The election was held at the request of the sponsor, the Society of Motion Picture Engineers.

Shortly after the new officers were elected, the membership of the sectional committee was reviewed and steps were taken to make sure that the personnel of the committee was up to date. As a result, organizations previously represented were asked either to confirm their representatives or to appoint new ones. In addition several other organizations not previously represented were asked to participate. Every effort was made to obtain competent representation from each branch of the industry and at the same time maintain a reasonable balance between producers, consumers, and general interest groups. The committee membership now stands as follows:

Acoustical Society of America, *F. L. Hopper*
American Society of Cinematographers, *Joseph Ruttenberg*
Anso Division of General Aniline & Film Corporation, *Alan W. Cook*
Bausch & Lomb Optical Company, *L. V. Foster, K. Pestrecov (Alternate)*
Bell & Howell Company, *F. L. Brethauer*
The Calvin Company, *Lloyd Thompson, F. O. Calvin (Alternate)*
DeLuxe Laboratories, Inc., *Edmund A. Bertram, Francis G. Grignon (Alternate)*
E. I. duPont de Nemours & Company, Inc., *J. E. Schmidt*
Eastman Kodak Company, *O. Sandvik, M. E. Russell (Alternate)*
Illuminating Engineering Society, *Ralph E. Farnham*
International Projector Corporation, *H. Barnett*
J. A. Maurer, Incorporated, *J. A. Maurer, Russell C. Holslag (Alternate)*

Mitchell Camera Corporation, *George A. Mitchell*
Motion Picture Producers & Distributors of America, *A. S. Dickinson, F. W. DuVall, D. Palfreyman*
National Bureau of Standards, U.S. Department of Commerce, *Raymond Davis*
National Carbon Company, Inc., *D. B. Joy, F. T. Bowditch (Alternate)*
National Electrical Manufacturers Association, *K. F. Abeel*
Optical Society of America, *A. C. Hardy*
Photographic Society of America, *F. Quellmalz, Jr (Alternate)*
Radio Corporation of America, RCA Victor Division, *M. C. Batsel, R. O. Drew (Alternate)*
Research Council of the Academy of Motion Picture Arts & Sciences, *Farciot Edouart, W. C. Miller, Gordon S. Mitchell*
Sectional Committee on Standardization in the Field of Photography, Z38, *Loyd A. Jones*
Society of Motion Picture Engineers, *F. T. Bowditch, E. K. Carver, C. R. Keith, D. F. Lyman (Alternate)*
Technicolor Motion Picture Corporation, *John R. Clark, Jr*
U.S. Navy Department, *Lt Comdr D. McPherson, Lt (jg) F. K. Mansfield (Alternate)*
U.S. War Department, Army Air Forces, *George Magnus, Lt. R. D. Fullerton (Alternate), Signal Corps, Major Lloyd T. Goldsmith, Capt E. B. Levinson (Alternate), Lt B. Nemec (Alternate)*
Western Electric Company, *G. R. Crane*
Member-at-Large, *Alfred N. Goldsmith*

The first items of new business are the possible reaffirmation of the 38 existing motion picture standards and consideration of new standards, the latter being at present largely confined to the extensive work done by ASA War Committee, Z52.

Reck Helps Chinese In Study of U. S. Standards

Dickson Reck, specialist in industrial standards, organization, and management, who has been for the past year in China under the Cultural Cooperation program of the Department of State, has recently returned to the United States. Mr. Reck accompanied S. T. Shang, Secretary-General of the Chinese Standards Committee, to the meeting in New York on October 8, of the United Nations Standards Coordinating Committee. During the next three months, Mr. Reck and Mr. Shang will visit American standardizing agencies, engineering societies and manufacturing plants to arrange for the transmission of technical

data and American specifications to the Chinese Standards Committee. Mr. Shang is also instructed by the Chinese Government to become familiar with American methods of developing and extending standards into industrial and agricultural production and distribution practice and to get a first-hand impression of American production methods in order to facilitate the development of standards in China.

Mr. Reck, while in China, assisted the Chinese Government in organizing their national standards organization, in developing the methods and procedures for establishing standards, and in building a program of standards development.

ASA Translates Argentine Electrical Standard

The third draft of a proposed Argentine standard covering Terminal Markings for Electrical Machinery and Apparatus has been translated by the Inter-American Department of the American Standards Association and is being circulated to a selected group for comment.

The proposed standard "establishes the method of marking terminals of electrical machinery and apparatus, in order to facilitate their identification in making connections." It covers alternating current generators and motors; direct-current generators and motors; transformers (excluding instrument transformers); synchronous converters and rectifiers; instrument transformers; measuring instruments; busses; and lines.

A limited number of copies of the translated draft are available from the American Standards Association.

Rhode Island Considers Transmission Apparatus Safety Code

Approximately 200 copies of a proposed safety code for mechanical power transmission apparatus have been mailed to manufacturers and others by a special state commission in Rhode Island. The commission is drafting safety codes and rules for places of employment in the state. The proposed safety code for mechanical power transmission apparatus is a modification of the American Standard Safety Code for Mechanical Power Transmission Apparatus, B15-1927.

ASA Committee Takes First Step For Low-Cost Clothing Standards

Asks that work go forward on electric flatirons, refrigerators, ranges, bedding, and textile tests; hears committee reports

DISAPPOINTED that the War Production Board did not accept its offer of help in preparing wartime standards for low-cost clothing, the Advisory Committee on Ultimate Consumer Goods, at its meeting November 14, voted to set up a committee to study the possibility of developing peacetime standards. Such standards are badly needed because of the shoddy materials that have been used in low-cost garments during the past few years, in the opinion of members of the committee. Even in peacetime, it was asserted, the retailer lacks information by which to judge the serviceability of the products he offers his customers. Recognizing that the function of the Advisory Committee is to serve as a "sparkplug" for consumer standards programs, the subcommittee that will be organized will make recommendations as to which of the problems in the consumer goods field should be undertaken first. The subcommittee is expected to report at the next meeting of the ACUCG in order that action on the proposed peacetime standards for clothing can be started without delay.

The ACUCG also heard reports and made recommendations for speeding the work of committees working on individual standards as follows.

Domestic Electric Flatirons, C70—

Sponsor: National Electrical Manufacturers Association

Work on this project had been held in abeyance on recommendation of the National Electrical Manufacturers Association, sponsor. However, new irons will be in production soon and in the opinion of the chairman of the committee work may well be undertaken again on the development of standards to cover the new designs. As a result of the report, the Advisory Committee voted

to recommend that the sectional committee resume its work.

Mechanically Operated Refrigerators, B38—

Sponsors: American Society of Refrigerating Engineers—U. S. Department of Agriculture—Bureau of Human Nutrition and Home Economics

Standards for measuring shelf area and volume and for tests of mechanically operated refrigerators were completed several years ago, but work on ice refrigerators was discontinued some time ago. Recently, those concerned have indicated an interest in having a standard completed soon for ice refrigerators. Because of this interest, the chairman of the committee has prepared a new draft, incorporating material from several earlier drafts. It is expected that a new draft of this proposed standard will be sent to the subcommittee for consideration soon.

Electric Water Heaters, C72—

Sponsor: National Electrical Manufacturers Association

Preparation of a draft standard was assigned to a subcommittee some time ago but because of the urgency of the work in their own companies, the members of the committee have not been able to complete their assignment. It was indicated that work is again about to be started.

Electric Ranges, C71—

Sponsor: National Electrical Manufacturers Association

Early in May, a draft standard for electric ranges had been completed by the chairman of the sectional committee acting as a drafting subcommittee. Copies of this draft are being circulated to the Range Technical Committee of the National Electrical Manufacturers Association, sponsor for this project, for comment before the draft is sub-

mitted to the sectional committee. It is expected that this draft standard will be ready for consideration by the sectional committee within a short time.

Proposed UNSCC Project on Testing of Textiles—

A proposed international project on testing of textiles to be undertaken by the United Nations Standards Coordinating Committee was referred to the Sectional Committee on Colorfastness of Textiles, L14, at the last meeting of the Advisory Committee on Ultimate Consumer Goods.

A subcommittee appointed by ASA Committee L14 selected approximately 90 test methods, taken from the publications of the American Society for Testing Materials, American Association of Textile Chemists and Colorists, National Bureau of Standards, Federal Specifications Board, and the American Standards Association. These test methods all are (a) generally accepted and used by laboratories in this country; (b) not liable to change before being brought up for international consideration; (c) reasonably satisfactory as far as the majority of users are concerned; (d) substantially agreed upon by those groups engaged in developing test methods."

The Advisory Committee voted that the recommendations of the subcommittee should be submitted to the Advisory Committee on the United Nations Standards Coordinating Committee of the Standards Council to be sent to the UNSCC as a basis for an international project.

Bedding and Upholstery, L12—

Sponsor: National Association of Bedding and Upholstery Law Enforcement Officials

A draft standard providing definitions for bedding and upholstery materials has been under consideration for some time. Because of differences of opinion on the part of law enforcement officials in states in which some of these proposed standard definitions are not used, no final action has been taken by the sectional committee.

The Advisory Committee voted to recommend to the sectional committee that the standards that have already been approved by a majority of the committee be submitted for approval with a foreword calling attention to the states in which the definitions are not used.

Definitions of Terms Used in Retailing, Z36—

Sponsor: National Association of Better Business Bureaus

The Bureau of Labor Statistics has accepted sponsorship of this project and it is expected that the work will now go forward without further delay.

War Standards for Industrial Clothing, L17—

Four standards for women's industrial clothing have been completed, and a final vote is being taken on two more. In view of the fact that Standards Council is urging all correlating committees to take action as soon as possible to have war standards reviewed through

the peacetime procedure, the Advisory Committee considered under what committees these standards could be reviewed. Because no peacetime committee now exists for industrial clothing, the Advisory Committee voted to ask Standards Council if the ACUCC itself has authority to serve as sponsor for a peacetime project.

International Cooperation—

Conferences are being carried out on standards for consumer goods with representatives of the British Standards Institution, the Standards Association of Australia, and the New Zealand Standards Institute.

At the end of the meeting the chairman announced that the National Association of Secondary School Principals, National Education Association, has issued its Consumer Education Series No. 6 on the subject "Using Standards and Labels". In this book, the Advisory Committee on Ultimate Consumer Goods is given favorable mention.

Cause and Cure

(From *National Safety News*, October, 1945)

Crane Signals—A crane operator, misinterpreting the hooker's hand signal, raised a load of steel plates prematurely, crushing the hooker's hand between hook and the load.

Correction: Investigation revealed that each craneman in the yard operated with different hand signals. A code of standard hand signals has been adopted and is being strictly enforced to prevent recurrence.

EDITOR'S NOTE. If the American Standard Safety Code for Cranes, Derricks, and Hoists, B30.2-1943, had been used in this plant, this misunderstanding would not have happened. The code contains a system of standard hand signals, which is recommended for use as a national standard.



New Jersey Association Hears Speech on Building Codes

"Standard Building Codes" was one of the subjects discussed at a meeting of the New Jersey Federation of Official Planning Boards at Atlantic City November 16. H. M. Lawrence, American Standards Associa-

tion, spoke on "Standardization of Building Codes"; Robert J. L. Cadinen, architect, on "Standard Building Codes"; and J. J. Kane, Portland Cement Association, on "Building Codes as They Apply to Masonry."

New Edition of National Directory of Commodity Specifications

The third edition of the National Directory of Commodity Specifications is now available. This 1300-page volume lists and briefly describes more than 35,000 standards and specifications of trade associations, technical societies, national industrial organizations, and government agencies.

This third edition, the first to be issued since the edition of 1932, has been greatly needed during the last few years and will be welcomed by American industry.

The Directory has been set up with a classification system which groups specifications and standards relating to similar subjects, in order to safeguard against duplication of material. A summary of each specification is given so that its scope can be immediately determined by the reader. Cross-referencing serves to tie up related specifications.

In the 146-page index, commodities are listed alphabetically and references are given to the classification groups in which the specifications for the particular commodities appear. It also provides the names and addresses of the standardizing agencies from which copies of the specifications can be secured.

The Directory was prepared under the supervision of Dr. A. S. McAlister, formerly chief of the Division of Codes and Specifications of the National Bureau of Standards. Copies of the Directory, Miscellaneous Publication M178 of the National Bureau of Standards, may be obtained, for \$4.00, from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

Association Sets Coffee Standards

A new use of standards has come to light with the recent announcement that the National Coffee Association (comprising 98 percent of the trade in this country) in cooperation with the Stevens Institute of Technology has set up certain definite objective standards to determine once and for all what makes a good coffee brew.

The Association also discloses that it has developed a standard coffee measure, holding precisely two level

tablespoons, to help overcome the careless methods of home preparation which have been in large measure, they believe, the cause for the disappointing quality of much coffee that is served. This measure, of red plastic with a four-inch handle, will soon be available.

Official directions and general recommendations have been offered by the Association's brewing committee on the correct method for making coffee.

"Measure coffee and water accurately. Use one National Coffee Association standard measure of coffee (or its equivalent, two level measuring tablespoons) to each six ounces of water. Use fresh water for making coffee. Water that has been pre-heated or drawn from the hot water faucet may impart an undesirable taste.

"Serve coffee as soon as possible after brewing. If necessary to let brewed coffee stand any length of time, hold at serving temperature by placing pot in pan of hot water or over very low heat on asbestos pad. Cooled coffee cannot be reheated without flavor loss.

"For best results always brew coffee at full capacity of the coffee-maker. Never boil coffee. Never re-use coffee grounds. Never allow cloth filters to become dry; keep immersed in cold water. Never use soap in washing cloth filters. Keep maker immaculately clean and always scald before using."

Foreign Trade Convention Endorses Standardization

The thirty-second National Foreign Trade Convention which recently concluded its annual meeting, held this year in New York, has reaffirmed its endorsement of a program of active standardization under the auspices of the American Standards Association. Approval was registered as in previous years for the establishment throughout the Americas of ". . . a comprehensive acceptance of agreed standards and specifications, as a necessary step forward in facilitating orderly commercial procedure, and closer inter-American commercial cooperations".

Singstad Retires from New York Tunnel Authority

Ole Singstad, member of the Board of Directors of the American Standards Association, nominated by the American Society of Civil Engineers, has retired from his position as chief engineer of the New York City Tunnel Authority. He is continuing his consulting engineering practice.

Wide discussion recently of scarcities of serviceable, economical textile products has extended beyond the public press and into technical meetings of scientists and technologists.

Two papers are included in this issue of **INDUSTRIAL STANDARDIZATION** which present complementary viewpoints—one viewpoint that of a scientist in a textile manufacturing company; the other that of a prominent retailer who wants to give his customers goods he knows will wear well under the conditions for which they were bought.

The textile manufacturer's viewpoint (page 274) is represented by an abstract of a paper presented by J. B. Goldberg before Committee D-13 on Textiles of the American Society for Testing Materials. Mr. Goldberg is Research Director of J. P. Stevens & Company, Inc.

The retailer's viewpoint is represented by a paper given by Irwin D. Wolf before the American Association of Textile Technologists, New York. Mr. Wolf is vice president and director of sales of the Kaufmann Department Stores, Inc, Pittsburgh, Pa., and chairman of the ASA Advisory Committee on Ultimate Consumer Goods.

Textile Testing for Consumers

By Irwin D. Wolf

In addition to tests for textile materials, retailers need more information about the "use-life" of the textile products they sell

RETAILERS are no more anxious than those engaged in textile technology to have soon again a flow of high quality merchandise to pass on to our customers. Many serious problems face us before unlimited supplies of goods of pre-war quality or higher are available for distribution. This is an opportune time to look back on some of the problems of the past and to try to think them out so that the knowledge, experience, and skill of technical associations shall be of greatest value to the distributors of goods and to their customers, rather casually described as the "consumer".

Testing for End-Use

Retailers have long believed that textile laboratories have concentrated too much on the testing of the materials of which goods are made, and too little attention has been given to the evaluation of the end product, the goods bought by our customers. The Kaufmann Department Store of Pittsburgh is one of the comparatively few stores maintaining a laboratory or using to any great extent the services of our excellent commercial testing laboratories. Yet, despite our intimate connection with the technical appraisal of many of

our goods, we sometimes feel that the tools and techniques of appraisal are more closely connected with the fabric of which a garment is made

Irwin D. Wolf is vice president and director of sales, Kaufmann Department Stores, Inc, Pittsburgh; and chairman of the ASA Advisory Committee on Ultimate Consumer Goods.

and not enough with the garment.

Perhaps we will never be able to determine in the laboratory just what the anticipated use-life of a bed sheet will be; how long a raincoat should remain water repellent under normal usage and cleaning; how many miles a man may walk in a pair of shoes, and how long and through how many washings a boy's wash suit will stand up. These definite figures may never be achieved. Perhaps we do not want to be in a position of telling our customers these estimates even with a limited guarantee. It would be of extreme value to a retail store, however, if its buyers were informed as to an approximation of these service lives so as better to compare the products of one manufac-

turer with those of another and to evaluate the comparative serviceability of their price lines.

How Will Washing Affect Blanket Warmth?

For example, as a distributor, I want to know quickly how the warmth of one blanket compares with another. I should also like to know for how long a time, under normal usage and washing, these warmth characteristics will be retained. It is entirely possible that in the long run the blanket having the poorer initial warmth-retaining qualities might retain them longer and prove to be the better one for our customer to consider at the price she pays.

Also, we anticipate an increased production of lighter weight fabric for outer wear for our customers of all ages and both sexes. It is one thing for the technologist to evaluate these from the standpoint of tensile strength, shrinkage, color fastness to the elements, and abrasion (whatever this test actually means in terms of wear), but it is quite another for the retailer to know the ability of the garment to stand up in service. We would like to know the ability of the garment as a unit to retain its shape, to withstand reasonable wear, to be readily cleanable, and, if there is some slight color change during service, whether this color change will be uniform.

Coming from an industrial community, perhaps I am more conscious of the cleanability factor than are many other retailers. We have had a sad experience with garments for boys' winter outer wear; the outer layer of water-repellent cotton fabric requires a strenuous washing operation to remove the sooty dirt carried into the fibers by our greasy smoke, but the shearling lining, or the flannel lining, as the case may be, will not stand washing due in one case to shrinkage and in the other to poor color fastness to soap and water. I would hesitate to say that the technologists who developed the water-repellent cloth for the outer layer were amiss in recommending it to manufacturers of boys' outer wear, but somewhere a serious error was made and garments, though warm, were unserviceable because they could not be cleaned satisfactorily either by dry-cleaning or by laundering methods.

During the war all of us bought what we could get, but even before

the war there were numerous cases in which fabrics woven, dyed, and finished with one end-use in view appeared in garments requiring entirely different use and exposure. I remember particularly some dressmaker-style bathing suits that were made of rayon which, we later found out, had been dyed and finished for the pajama and houserobe industry. At least, the color fastness to light and to water indicated that they had very limited color fastness.

I should like to see textile technologists take a strong stand for the informative labeling of goods to help guide these into the proper channels of manufacture for distribution to our customers.

Reconversion—New Standards vs Blitz Goods

I am firmly convinced that our reconversion should be mental, as well as production-wise. A great many merchants and buyers, during the war years, have forgotten how good their pre-war merchandise really was. We may be inclined to accept a small improvement over today's goods as being a satisfactory value for our customers. Do technologists know from records the pre-war data on the goods woven, dyed, or finished? Do you know the performance of fabrics of certain weaves?

Reconversion to pre-war standards of thought and of merchandise quality will be slow in many kinds of textile goods. In the meantime, we are stocked with an apathy toward quality standards that has seized our minds during nearly four years of war. We have stocks of blitz-goods to dispose of and for which today there are eager customers because neither retailers nor customers can get anything better. Unless manufacturers and retailers reconver to an aggressive merchandise-quality stand before the consumer does, we will both be stocked with blitz-goods for which there will be no customer demand.

Our goods must be serviceable and fashion-right. We must have them when the customer wants them and in full size, color, and style assortments, and within all our pre-war range of price lines.

Each of us should consider himself responsible for providing an impetus toward the steady increase in quality and should see that the information concerning the goods is passed onto the next unit in the production-distribution chain until the

ultimate customer receives as much information as is useful to her.

Sale of Products Developed for Use of Army and Navy

With the increased tempo of peacetime production, all of us are going to be faced with the problem of the promotion of fabrics, finishes, and other goods because "the Army and Navy used it during the war". Manufacturers of goods and the retailers who sell them are much more vulnerable to this argument than are technologists. We have been told so often throughout the war that our Army and Navy were the "best equipped, best clothed, best fed and best sheltered in the history of warfare", and so many loose promises have been made to us on the results of wartime research that our buyers and our customers are convinced that Army use signifies a guarantee of the quality of all such equipment.

As far as our store is concerned, we have been cautioned repeatedly by our Fellowship at Mellon Institute to weigh with caution the claims that will be made on this basis. We all know that for the sake of procurement, the Army and Navy had at various times to buy and use many products of fair performance. When the development and production of more desirable products reached a high enough level, those of poorer performance were no longer purchased. However, today and tomorrow, we will constantly have before us as a principal sales point "Our product was used by the Armed Forces". Naturally, we do not expect the ABC Company to say to us "Our mildew-resistant finish was used exclusively by the Army until the XYZ product came on the market, at which time ours was dropped from procurement because the fabric deterioration was 50 percent greater with our finish". Nor would we expect the DEF Company to say "Our product was used by the Navy for its wind-resistant water-repellent jackets, but when the STU Company's permanent finish was available, ours was no longer used because of 30 percent poorer water repellency".

We shall depend upon textile technologists to evaluate the performance of all these finishes and the many special textile weaves used by the Army and Navy in order to tell us which kinds of merchandise and what price lines may best use

these war-born or war developed products.

What Do Test Results Tell Us?

My basic theme has been the need for critical appraisal of products prior to their being put on the market and with particular emphasis on end-use. The problem is not an easy one. I suspect it will involve the very critical study of your own laboratory test methods and of the interpretations which may be drawn from these methods and results. I believe, as do most retailers, that customers are entitled to know more about the things they buy and that the information must be accurate and based upon adequate sampling, testing, and interpreting. In this study, associations such as the American Association of Textile Technologists, the American Society for Testing Materials, and the American Association of Textile Chemists and Colorists, have a very real responsibility.

Laboratory Findings for Benefit of Consumers

The perfection of test methods and the translation of the results in terms of consumer needs is in your hands, not in the hands of the individual textile manufacturer, processor, garment manufacturer, or retailer. The information collected in your laboratories must be passed on to the users of the material through all economic levels. I suspect that many of you have watched with great interest the use-testing techniques so widely used by the Quartermaster Corps during the war. Granted that actual wear tests are costly and time consuming, it seems to me that when the record of the achievements of the Research and Development Branch of the Office of the Quartermaster General are finally compiled and disseminated to the textile industry, it is very probable that all of us utilizing the services of technical staffs will find a way to apply this technique to some extent in the appraisal of many types of goods and in rating the use-performance of various price lines in the same class of goods.

Informative Labels a Real Necessity

When performance data, whether they be laboratory test appraisals or use-test results, have finally been assembled, the information can be of most use to retailers and to the ultimate consumer in the form of informative labels. I urge that the

technical societies do their level best to encourage the use of informative labels by the companies by whom they are employed, or by the laboratories they represent. The data should be based on standard methods of appraisal or by tests readily identifiable by the user of the product.

It may be argued that tags and labels do not add greatly to the display value of merchandise and that in the past store buyers have removed informative labels from the goods before putting them on display. In this respect retailers must put their own house in order. It is a bad habit and offers a serious bottleneck in the channeling of helpful information from the producer to the ultimate consumer. I anticipate that the confusion that will result when our postwar textile industry really gets moving will make buyers and sales people require every possible bit of information afforded by tags and labels.

In defense of my own business, I might offer the observation that retailers might be more willing to keep the labels on if they were designed better in the first place. Many textile labels appear to our buyers to be not fully informative and intended to serve principally as a medium for the advertising of the manufacturer's name rather than a consumer aid.

In urging the active promotion of informative labels based on scientifically correct test methods, a word of caution must be given. Because of the inadequacy of some of your test procedures to translate the end-use value of a product in terms of the laboratory test results, there has been a tendency in the past to put too broad an interpretation on some of the test results. This amounts to the mis-application of a test method, and statements on labels are therefore under suspicion. If laboratory results are to be of dependable value to the users of the product, the data must be technically accurate, competently interpreted, and fully presented to the user. If the art and science of textile technologists are called upon by industry to evaluate its products from the end-use viewpoint, you will find, I am sure, that your laboratories will be working primarily in the interest of the consumer of your products even more than for the producer who employs your services.

Much research must be carried out if we are to know exactly what will be of greatest use to the ultimate consumer in the form of test data, merchandise standards, and informa-

tive labels. Perhaps those of us in retailing can be of real help to the laboratory technologists working for the producers of goods in giving them a more accurate index of consumer needs and wants. I do not have time here to go into an explanation of the wants of consumers as contrasted with the wants of consumer leaders who are actuated with the long range aspects of the problem. The impracticality of the present day status of some of our labeling regulations is emphasized by the fiber-content labeling regulations which give no indication whatever as to the serviceability or suitable end-use of a fabric.

Let me emphasize the fact that the retail distributor and the laboratory technologist are dependent each upon the other. Only by our combined efforts can retailers and their customers obtain information and standards of quality to supply the ultimate consumer with the best product she can buy for the purpose intended and at the price she can afford to pay.

ASTM Announces Date For 49th Annual Meeting

The American Society for Testing Materials announces that its Forty-ninth Annual Meeting will be held in Buffalo from June 24 to 28, 1946. The Seventh Exhibit of Testing Apparatus and Related Equipment will be given in conjunction with the annual meeting.

The 1946 Spring Meeting of the Society will be held in Pittsburgh during the week of February 25 to March 1. This week will also be ASTM Committee Week, during which there will be many meetings of ASTM technical committees.

Uniform Bedding Laws Studied by Manufacturers

The National Association of Bedding Manufacturers devoted its session on the second day of its meeting November 27 to the importance of uniform laws governing bedding. The Association endorsed the establishment of a laboratory for research and testing of materials. It is expected that work on this will begin at once and as soon as possible the Association will organize its own laboratory and report on findings to its members.

Textiles – Tests

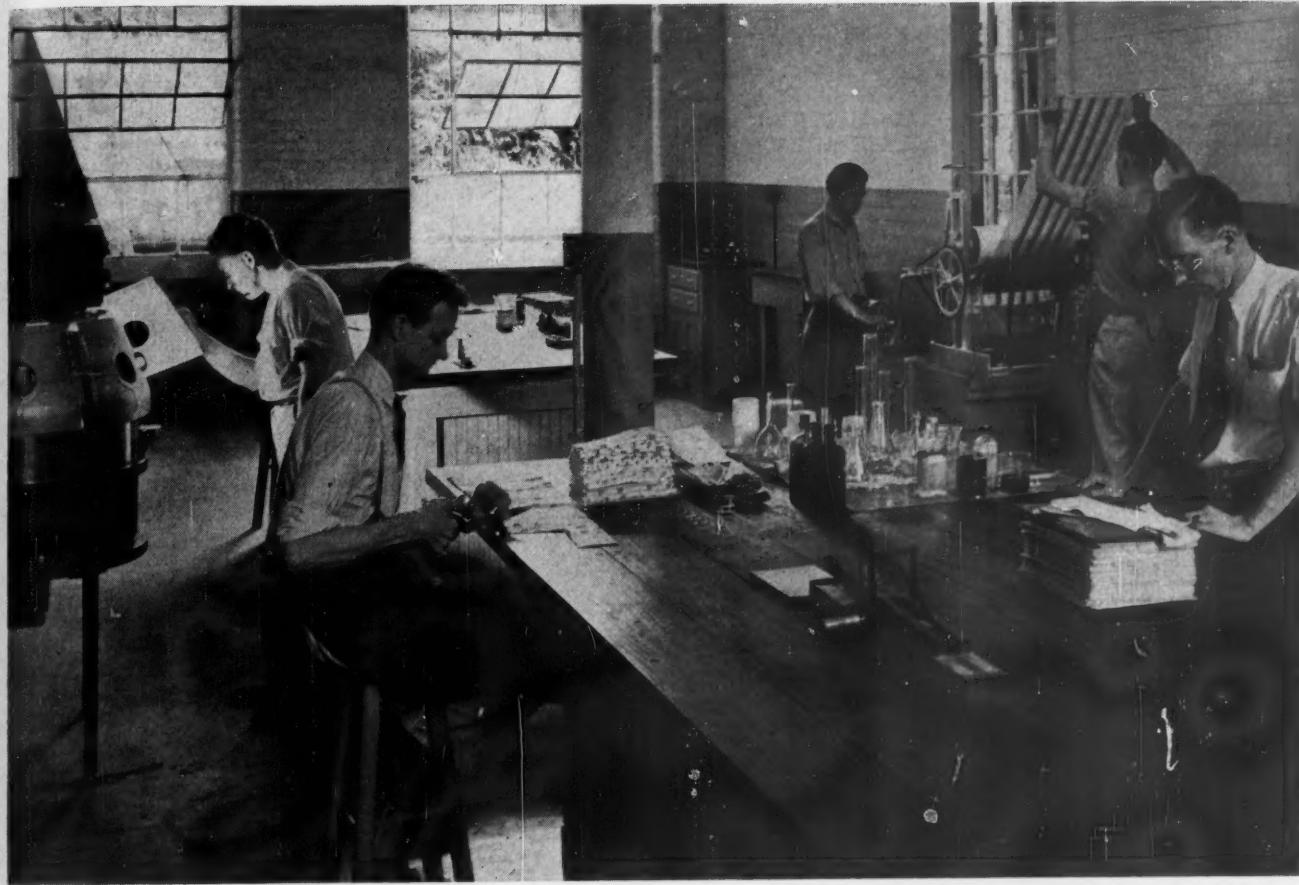


Above—Here bolts of cloth are being matched for color. Other color matching by small samples has preceded this step several times at different stages of the dyeing. This is the final stage and assures that the bolts supplied in a single order will be uniform in color. A strong light that does not cast shadows and that approximates daylight in intensity is being used so that matching can go on day and night under uniform conditions.



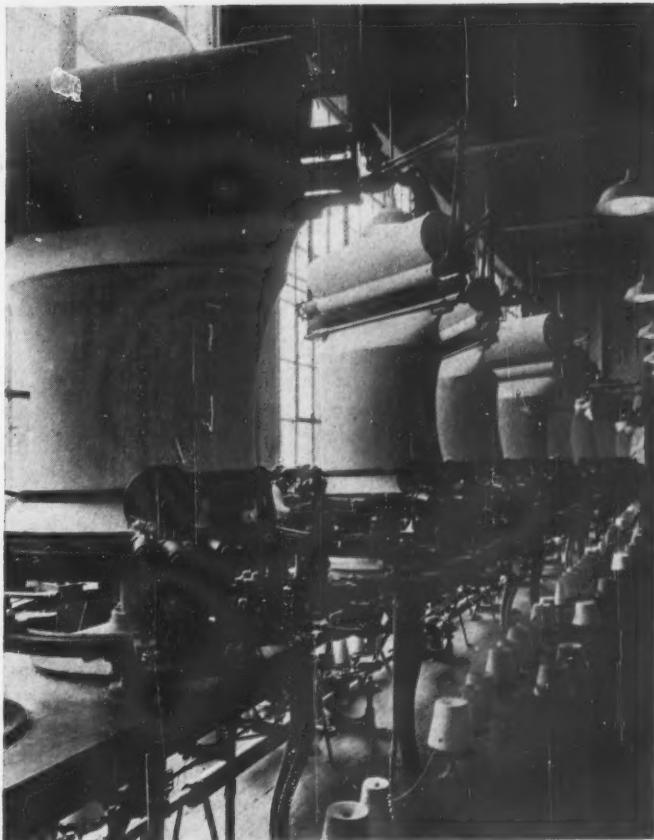
Left—This is the machine that accomplishes the process of Sanforizing material. The wet, steaming fabric is run between felt rollers, one of which moves faster than the other so as to compress the fabric. The result is that the average residual or remaining shrinkage of the fabric is less than one percent in use. Tests are made on small samples of the fabric before it is run between the rollers in order to decide how much compression is needed.

and Manufacture



Above—Section of a textile testing laboratory. At far left stands a Fade-Ometer, used in tests to predict the effect of sunlight on the dyes. In this test, samples of the fabric are exposed to the bright carbon light inside the Fade-Ometer. The man seated at the table at center left is preparing samples for testing. Reagents for chemical tests are on the table in the foreground. At center front of the table is a Crockmeter, a machine for measuring the rubbing off of color of fabrics.

Right—A circular knitting machine knits fabric in tubular form. The material is drawn upward by hand until it can be caught between the rollers. From then on it rolls automatically. Fabric is carefully arranged on lower roller to be the proper un wrinkled width on the top roller. This material is knitted cotton popularly known as jersey. These machines need practically no tending except replacement of yarn when necessary.



Tomorrow's Textiles—Yesterday's Tests

By J. B. Goldberg

Standard tests and specifications for textiles too often fail to provide information concerning performance and "usability," and therefore are not suitable standards for consumer goods, Mr. Goldberg declares in this paper.

THE postwar period promises numerous new fibres, fabrics, and finishes but our evaluation of their merits depends on the soundness of our testing procedure and interpretation of the data. Before becoming too concerned with the potentialities of the textiles of tomorrow there is a definite need for improvement in the testing technique used today.

For example, in the outerwear field, it is reasonable to assume that there will be considerable development of comparatively light-weight fabrics which are important in such clothing—heat insulating properties, wind and rain resistance, and resistance to wear, but we are lacking the simple instruments and standard methods of measuring these properties and the interpretation of results which will mean something to the consumer.

For measuring thermal insulation there is need for an instrument that will give reproducible results on a sample in less than several hours, that can be operated by someone who is not a trained physicist, and the results of which can be translated into comparatively simple standard units.

With the rapid developments being made by the chemists to provide better and more durable water-repellent finishes, we are certain to see wider applications to tomorrow's fabrics. Although we have a standard hydrostatic test, a spray test, and a water-immersion test, what a consumer wants to know is "Will this fabric as a raincoat keep the rain out and for how long?", or, "Will this shower curtain resist hot water, cold water, and soap for a reasonable length of time?" There is need for a simple specific test to evaluate the suitability of fabrics to be used in raincoats and a means of interpreting the facts so that the layman can understand them.

A great deal of emphasis has been placed on the air permeability of

clothing used by our armed forces, and it is safe to assume that this characteristic will receive a certain amount of promotion in the garments of tomorrow. The National Bureau of Standards' instrument, originally developed about 13 years ago, is reasonably good to measure the air flow through parachute fabrics, but it is of doubtful value on the less permeable, so-called wind-resistant fabrics. For testing such fabrics the instrument in use today is the Gurley Densometer, but it was originally designed for the testing of paper and leaves much to be desired when used for testing fabrics.

J. B. Goldberg is Research Director, J. P. Stevens & Company, Inc., New York.

Tear resistance is a term which is very familiar to those of us who have been concerned with the delivery of parachute fabrics to the Ordnance, Air Corps, and Navy Departments. There are a variety of so-called standard test methods—strip, trapezoid, Finch, and Elmendorf, but nobody seems to be quite sure of which test means what in terms of fabric performance.

Resistance to puncture, which is actually the initial starting point of a tear (excluding parachute fabrics), is of great importance, yet we have no standard method for making such a test.

Breaking strength is one item which is almost always included among the specifications for textile materials, whether they are going into sheets or parachutes, dress goods, or tents. Serious considera-

EDITOR'S NOTE: Since this paper was prepared the American Standards Association has approved the American War Standard Specifications for Chemical-Resistant Gloves, L18.29-1945, which includes a method of test for puncture resistance.

tion should be given to the problem of improving the reliability of the information provided with tensile strength testing machines of today, and restricting the inclusion of such test results to specifications where we have definite proof of their significance.

For work clothing and certain outerwear, the abrasion resistance of fabrics is an extremely important property. Some fibers, constructions, and finishes are said to contribute to increased abrasion resistance but there is no testing machine that meets with the approval of the American Society for Testing Materials, or any other technical group whose duty it is to lead the way in developing standard test methods.

No Standard Test for Stretch or Sag

In the field of dress goods and suitings where cotton and rayon are concerned, it is expected that considerable emphasis will be placed on crease resistance, resilience, crush resistance, or wrinkle-proofing. These characteristics are of course important in numerous other items, such as blankets, neckties, pile upholstery, interlining, cushion filler, and rugs. We have heard of countless claims made for the synthetic resins and fibers themselves which are supposed to make a woman's dress crease-proof or make a crease stay in a pair of men's slacks, depending on which claim will sell the most goods. But we have no good testing instrument or method for determining these characteristics.

Fabric stability is another much-discussed item, but how are we to test a fabric's stability when we still do not have a good foolproof ordinary wash test for the determination of shrinkage in rayon fabrics? As recently as October, 1944, the American Association of Textile Chemists and Colorists Committee for studying the dimensional changes in fabrics in home laundering, dry and wet cleaning, reported that we are still far from solving the problem of how to make suitable laboratory tests and how to correlate them with actual performance. Perhaps the solution lies in the successful chemical and mechanical finishing of properly constructed fabrics which will permit the use of cotton wash tests. To be perfectly honest, perhaps our test

methods are not so bad, and the difficulty lies in the efforts of some technicians to convince themselves or others that when a rayon fabric shrinks or stretches too much the technique must be wrong.

Fabric stability also involves the determination of unidirectional and multidirectional creep under both single applications of load and repeated stress. How can we assure a woman that a fabric will not stretch, sag, or bag when we have no approved standard test method to satisfy ourselves?

Wash Tests for Color Fastness Inadequate

Although the importance of color fastness may be considered a problem for the chemists rather than for members of the ASTM, the development of a suitable piece of equipment for the determination of the light fastness should be of interest to all of us. The so-called standard method for measuring resistance to light is apparently unsatisfactory since I have been told that there are not many instruments that can be relied upon to give check results. It has also been reported that the standard wash tests for color fastness are inadequate. Here again, the easiest way out would be the development and application of dyestuffs which are so fast to light and washing that they will pass the most severe test on any machine.

There are other tests which leave much to be desired before we can say that we are prepared to meet tomorrow's textiles. These include tests for resistance to mildew of various types, resistance to moth damage, flame-proofing, fabric shifting, or slippage.

Fortunately, there are active

groups working on improving our test methods for many of these properties. Under private sponsorship, new testing instruments are being designed to give true characteristics of fibers and fabrics under constant and repeated stress and impact loads. In addition, a new approach is being made to the study of resilience. In one of the commercial research laboratories, new technique has been developed to make the testing of yarn and fabric abrasion resistance a scientific operation with results that can be readily reproduced and interpreted into fabric performance. Similar work is being done in these same laboratories to simplify the measurement of thermal insulation of textiles.

Another commercial laboratory has recently announced the development of an instrument to measure the slippage of yarn in fabrics, and we hope that this will stimulate sufficient interest to consider its approval as a standard test method, or the proposal of some better method. The combat course at Camp Lee has yielded worth-while information on the durability of clothing, and the experimental shower room at the Philadelphia Quartermaster Depot has been used to evaluate the resistance of fabrics to rainfall under varying conditions.

There are undoubtedly many other agencies cooperating in the testing of the thousands of textile materials going to the armed forces, and we look forward to the time when this information will be available to aid and guide us in a more intelligent study of the physical and chemical properties of fabrics.

In the meantime, let us stop dreaming about tomorrow's textiles and wake up to realize that we do not know enough about the fabrics we have with us today.

ASME Honors Moss, Durand, and Juran

At its annual meeting November 26-29, the American Society of Mechanical Engineers presented the Holly Medal to Dr. Sanford A. Moss, General Electric Company, for his many contributions to the development and application of turbosuperchargers to internal combustion engines. The Medal is awarded each year for "some great and unique act of genius of an engineering nature."

The Society presented the ASME Medal to Dr. William Frederick Durand, professor emeritus of mechanical engineering, Stanford University, California, in recognition of his

work in forwarding the design and application of principles of jet propulsion and for his effective leadership of the division of engineering and industrial research, National Research Council.

Joseph M. Juran, professor of and chairman of the department of administrative engineering, New York University, was recognized for his contribution to the problem of quality control in mass production, and other writings. He received the Worcester Reed Warner Medal, which is given for noteworthy contributions to engineering literature.

Welding Research Council Names Spraragen Director

The Welding Research Council of the Engineering Foundation has announced the appointment of W.

Spraragen, formerly Executive Secretary of the Council, to the newly created position of Director.



W. Spraragen

The Welding Research Council is a cooperative scientific research organization which is engaged actively in the study of matters related to the science and art of welding. Sponsored by the American Welding Society and the American Institute of Electrical Engineers it operates in close cooperation with all major engineering societies.

Mr. Spraragen has long been identified with research and welding. He has served as Executive Secretary of the Welding Research Council since its organization in 1935 and his connection with the welding industry dates back to 1918 when he was appointed Research Assistant to the Welding Research Committee of the National Council of Defense and the Emergency Fleet Corporation. Mr. Spraragen was editor of the first two editions of the *Welding Handbook* published by the American Welding Society. An important duty assigned to Mr. Spraragen in his new post will be the administration of the work of a Pressure Vessel Research Committee now being organized.

Aid for Selection of Harmonious Colors

To help the homemaker select carpets, draperies, upholstery, paint, and wallpaper, in perfect color harmony, the Institute of Carpet Manufacturers has issued a card of nine basic standard colors which have been tested and proved to be of definite sales value.

The Institute explains: "The basic color card does not mean that individual mills are confined to nine colors. Nor does it mean that any mill need make all nine colors. It does mean that if a carpet is sold as a basic color, it can be coordinated with drapes, wallpaper, paints, and so forth."

Chile Gives Institute Recognition As National Standards Association

Makes it the authority for preparation of standards used by Government departments; centralizes technical work

THE Instituto Nacional de Investigaciones Tecnológicas y Normalización of Chile, which was set up recently to work on technical standards in that country, has now been given recognition by the Government of Chile as the national standardization body of that country. It is to be the agency of the government departments for technical studies and for the preparation of standards.

The Institute, with headquarters in Santiago, was formed by the University of Chile, the Chilean Institute of Mining Engineers, Chilean Engineers' Association, and the Corporation for Development of Production. The announcement of the organization of the Institute with a description of its program was published in the February, 1945, issue of INDUSTRIAL STANDARDIZATION.

"Official Standards" to Be Mandatory for Government Use

As a result of the Government's action, the administrative departments of the State are directed to entrust to the Institute the study and preparation of technical standards unless they are carrying out such studies through their own personnel. When the technical standards approved by the Institute have been declared "Official Standards" ("Normas Oficiales") by the President of the Republic they are to be mandatory for use by all the Services of the State Administration.

All the Services are to provide copies of their publications for the library of the Institute and furnish any information the Institute may need to carry out its work.

Centralizes the Technical Work on Standards

The action of the Chilean Government in recognizing the Institute as a national institution was taken in order to centralize the technical work and preparation of technical standards, and also give the Institute the government standing it needs in its relations with the national standards associations in the other American Republics. The Government found

that the Institute is adequately constituted to meet the needs of the public service as well as those of private industry in technological investigation and preparation of technical standards. It also found that the Department of Technical Standards of the Institute gives technicians, producers, and consumers due opportunity to participate in its work, as is the practice of similar organizations operating successfully in industrial countries.

War Standard on Screw Threads Converted to American Standard

The first American War Standard to be changed to an American Standard is Straight Screw Threads for High-Temperature Bolting (For Use with Pressure Vessels and Steel Pipe Flanges, Fittings, and Valves), B1.4-1942, now known as Screw Threads for High-Strength Bolting, B1.4-1945.

This war standard was originally promulgated to meet the severe requirements demanded by increased wartime use of high pressures and

temperatures in pipe lines and pressure vessels. Approval as an American Standard will promote standard screw thread practice for high-temperature bolting in peacetime.

The sponsors of the ASA project on Screw Threads are the American Society of Mechanical Engineers and the Society of Automotive Engineers.

Ship Standards Made Parts Transfer Easy

Standardization of the engine room and machinery design in Liberty ships has meant the saving of an immeasurable number of hours and days saved in making repairs, because standard parts were available, Daniel S. Brierley, director of the Maritime Commission's Division of Maintenance and Repair, declared recently.

"Incredible as it might seem," he said, "it was actually possible to remove pistons, complete with rings, from an engine of a West Coast manufacturer, installed in a very badly damaged vessel, the repair of which was impossible, and install them in the engine of an East Coast manufacturer in a vessel needing comparable minor repairs, without any alteration or machine work whatsoever. Actual case after case of similar transfers could be described, ranging from such component parts as high-pressure, medium-pressure, or low-pressure cylinders, complete all the way to connecting rods, and even crankshafts," he said.

Motion Picture Engineers Sponsor Peacetime Work On Standards

In calling attention to the fine work done by the ASA War Committee on Photography, in the September issue of INDUSTRIAL STANDARDIZATION, we mentioned the fact that the American War Standards are now available for consideration as peacetime standards. Unfortunately, however, we mentioned only one of the peacetime committees that will have jurisdiction over these standards.

The peacetime work is under the supervision of two sectional committees—one on Standards for Motion Pictures, Z22; and the other on Standardization in the Field of Photography (Other than Cinematography), Z38.

This second committee, as mentioned in the September issue, is sponsored by the Optical Society of America.

The Sectional Committee on Standards for Motion Pictures, Z22, is sponsored by the Society of Motion Picture Engineers.

South African Government Sets Up Bureau of Standards

New Bureau will cover industrial, consumer, and scientific standards, in the international field as well as national

The South African Government has just established a Bureau of Standards with broad powers "to promote standardization in industry and commerce; to provide facilities for the testing and calibration of precision instruments, gages, and scientific apparatus; and to control the use of standardization marks and distinctive marks." The bureau was created by an Act of Parliament June 1, 1945. Its work will cover industrial, consumer, and scientific standards, and international as well as South African standards activities. As outlined by the Act, the functions of the bureau are as follows:

- (a) To promote standardization in industry and commerce;
- (b) To provide facilities for the testing and calibration of precision instruments, gages, and scientific apparatus, and for the issue of certificates in regard thereto;
- (c) To provide facilities for the examination and testing of commodities and any material or substance from which they may be manufactured, produced, or processed;
- (d) To control the use of standardization marks and distinctive marks;
- (e) To encourage or to undertake educational work in connection with standardization;
- (f) To cooperate with any person, association, or organization outside the Union having objectives similar to those for which the Bureau is established;
- (g) To assist any Department of State or any local authority or any public body in the preparation and framing of any specifications required by it;
- (h) To assist in the preparation and framing of specifications intended to be standard specifications;
- (i) To cooperate with the representatives of any industry or with any Department of State, local authority, or other public body or any person in securing the adoption and practical application of standards; and
- (j) To provide for the testing, at the request of the Minister and on behalf of the Government, of locally manufactured and imported commodities with a view to determining whether such commodities comply with the provisions of the Merchandise Marks Act, 1941, and other laws dealing with standards of quality.

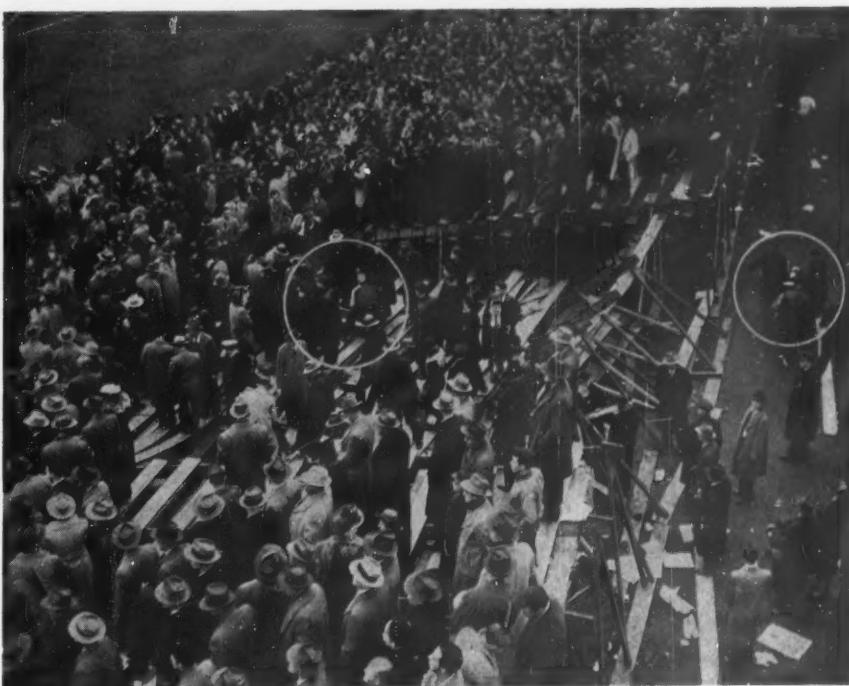
Standards Council Will Formulate Policy

To carry out these purposes a corporate body, the Standards Council, is being established. The Council, which will formulate policy on

broad national lines, will consist of five members appointed by the Minister of Economic Development. With the approval of the Minister, the Council will appoint the Director and the staff of the Standards Bureau.

The Council is authorized to designate as a standardization mark any

mark approved by it or by the Bureau as a standard specification for a commodity, provided the mark does not conflict with any trade-mark registered under the Patents, Designs, Trade Marks, and Copyright Act. The Council may also, after publishing specifications, make compulsory the adoption of a standardization mark indicating that the commodity in question has fulfilled the requirements. The Council is also empowered to compel holders of permits to submit samples; and inspectors, acting under the Council's direction, may enter business premises to inspect books, procure samples, and inspect operations.



When American Standard Safety Requirements Are Not Followed—

Temporary bleachers collapse; fans are injured

This temporary grandstand, erected for the Cleveland Rams-Green Bay Packers football game, in November, collapsed under the weight of the fans' enthusiasm when the wet, slippery ground allowed the supports to give way. None of the injuries were serious, although seven persons were taken to the hospital. The circles in the picture above show police removing the injured. The American Standard Building Code Require-

ments for Portable Steel and Wood Grandstands offers suggestions for requirements that would help prevent such accidents. A second standard, to offer protection against hazards in tents, grandstands, and other places of outdoor assembly, is now nearing completion. This new standard provides supplementary requirements to protect audiences attending circuses, carnivals, sports events, and other outdoor meetings.



Electrical Committees Report -1945-

Plans for peacetime work include reorganization of committees, and consideration of standards already approved for reaffirmation or revision; committees tell ESC about postwar programs

THE reports of the sectional committees on electrical projects (under the supervision of the ASA Electrical Standards Committee) indicate a definite trend toward acceleration of peacetime work on the part of many committees completely or partially inactivated by the war. A number of committees and projects are now, or will soon be, in the process of reorganization. Some American War Standards have already been mentioned for future committee consideration as American Standards.

A total of seventeen standards will be considered for revision and four for reapproval in the coming year. A new edition of the National Electrical Code will be made available in 1946. Eight standards will be up for reaffirmation and ten others were reaffirmed this year. Three recently approved American War Standards, being considered for conver-

sion to American Standards, are Controls for Resistance Welding Machines, C52.4-1945, Specification for Resistance Welding Machines, C52.5-1945, and Straight and Offset Resistance Welding Electrodes and Electrode Holders, C52.3-1945. Three ASA War Committees completed their work and went out of existence in the past year. They are: Replacement Parts for Civilian Radio, C16; Electric Indicating Instruments, C39; and Radio, C75.

Reports of the committees are summarized below. The organization sponsoring the work is listed following the report of each committee. The names of the chairman and sec-

The illustration above shows a thyratron half-cycle welding control panel used with bench welder for spot-welding vacuum tube assemblies. For a report on the status of welding standards, see C52.

retary of the committee are given in those cases where the Electrical Standards Committee is sponsor.

National Electrical Code (C1)—

At a meeting of this sectional committee in October there was a total attendance of well over 100 people representing nearly all of the cooperating organizations in the membership. Many changes in the provisions of the 1940 edition of the National Electrical Code were agreed upon and several new Articles will be incorporated in the new edition. The printer's proof for the text of the 1946 Code will be submitted to the voting representatives for letter ballot, after which the committee will report to the sponsor. The new edition will probably be available sometime in 1946.—National Fire Protection Association.

National Electrical Safety Code (C2)—

Safety Rules for the Installation and Maintenance of Electrical Supply Stations, C2.1-1941

Safety Rules for the Installation and Maintenance of Electrical Supply and Communication Lines, C2.2-1941

Safety Rules for the Installation and Maintenance of Electric Utilization Equipment, C2.3-1941

Safety Rules for the Operation of Electric Equipment and Lines, C2.4-1939

Safety Rules for Radio Installation, C2.5-1940

No revision of any of the five parts of this code is contemplated at this time. Various parts of it are just now being worked into the requirements of the Public Utility Commission and similar standards in the different states, and they are being widely adopted by governmental bodies.—*National Bureau of Standards*.

Code for Protection Against Lighting (C5)—

Revision of Part III of the code was approved as an American Standard in 1944, and in 1945 it was issued as part of the National Bureau of Standards Handbook H40 (superseding Handbook H21). The sponsors have been reorganizing the committee. Representatives of the National Fire Protection Association which was added as a sponsor in 1944 are to be included as well as representatives of other organizations. When the reorganization is completed the committee will begin the revision of other parts of the code.—*American Institute of Electrical Engineers; National Bureau of Standards; National Fire Protection Association*.

Terminal Markings for Electric Power Apparatus (C6)—

Considerable work is being done by NEMA on this general subject which it is anticipated will lead to some modifications in the American Standard. The work is expected to take at least another year.—*National Electrical Manufacturers Association*.

Insulated Wires and Cables (C8)—

This committee has been inactive during the past year; however, it is expected to resume active work at an early date. Among the problems that will be dealt with is a thorough re-examination of the membership of the committee, and the appointment of new members from groups that have hitherto not been represented on the committee. After that, the present wire and cable standards will be given a careful examination, and it is expected that it will be necessary to develop a considerable number of new standards. The technical committee chairmen are at present considering which of the existing standards should be reaffirmed.—*W. F. Davidson, Chairman; C. S. Gordon, Secretary*.

Hard-Drawn Aluminum Conductors (C11)—

Reaffirmation of the present American Standard has been considered and a ballot of the committee is now being conducted.—*American Institute of Electrical Engineers*.

Code for Electricity Meters (C12)—

There has been no activity in connection with this project during the year.

The war standard revision of this code,

C12WS, will not have to be reconsidered because it contains a statement which in effect restores the pre-war values of testing schedules for meters, to begin not later than six months from the cessation of hostilities.—*National Bureau of Standards; Electric Light and Power Group*.

Tubular Steel Poles for Electric Line Construction (C13)—

There has been no action by this committee during the past year.—*American Transit Association*.

750-Volt Direct-Suspension Overhead Trolley Contact Construction (C15)—

There has been no activity in connection with this project during the past year.—*American Transit Association*.

Radio (C16)—

This committee is being reorganized so that it may again resume work. It is responsible for the consideration of the various war standards developed in its field.—*Institute of Radio Engineers*.

USNC Holds Annual Meeting

The U. S. National Committee of the International Electrotechnical Commission, which works closely with the ASA Electrical Standards Committee, held its annual meeting November 9, and re-elected its officers:

E. C. Crittenden, National Bureau of Standards, *President*

L. F. Adams, National Electrical Manufacturers Association, *Vice President*

H. S. Osborne, Member-at-large, *Vice President and Treasurer*

The membership of the U. S. National Committee of the IEC is the same as that of the Electrical Standards Committee, with the addition of representatives of the American Society of Mechanical Engineers and individual technical experts.

The meeting considered the future organization of international standardization.

Dry Cells and Batteries (C18)—

This committee has not been active this year; however, a revision of American Standard C18-1941 is anticipated when the situation with regard to battery manufacture and markets becomes clearer.—*National Bureau of Standards*.

Industrial Control Apparatus (C19)—

A new NEMA publication, Industrial Control Standards, No. 45-97, will be submitted to the sectional committee in the near future for consideration in a revision of the American Standard, C19.1-1944.—*American Institute of Electrical Engineers; National Electrical Manufacturers Association*.

Insulators for Electric Power Lines (C29)—

The American Standard for Insulator Tests, C29.1-1944, was published early in 1945.—*J. A. Brundige, Chairman; R. M. Havouri, Secretary*.

Specifications and Standards for Electrical Devices and Materials with Relation to Fire and Casualty Hazards (C33)—

There has been no activity in connection with this project since its last report in October 1944.—*Underwriters' Laboratories*.

Mercury Arc Rectifiers (C34)—

The Mercury Arc Power Conversion Subcommittee (formerly the Rectifier Subcommittee) of the AIEE Electronics Committee has completed a draft of standards for Pool Cathode Mercury Arc Power Converters. This draft was adopted at a meeting of the subcommittee. Upon approval by the Electronics Committee of the AIEE these standards will be forwarded to the Standards Committee of the AIEE. ASA Sectional Committee C34 will begin work on this draft of the standards as soon as it is referred to the sectional committee.—*American Institute of Electrical Engineers*.

Railway Motors (C35)—

The only matter before the committee is a request for a definition of certain conflicting items in the American Standard C35.1-1943 (AIEE No. 11), which is now being considered.—*American Institute of Electrical Engineers*.

Power Switchgear (C37)—

American Standards C37.4-1945 through C37.9-1945 have been published. A revision of C37.2-1937 (Automatic Stations) will probably be approved before the end of the year. It is at present in the hands of the ASA, following approval by the sectional committee.

Deferred projects which are awaiting the outcome of AIEE committee work include:

High-voltage fuses and current-limiting resistors
Switchgear assemblies
Metal enclosed switchgear

Inactive projects, on which ASA standardization activity would be premature, are:

Air switches (C37.3)
Large air circuit breakers (C37.11)
Power connectors
Network protectors

George Sutherland, Chairman; G. S. Lunge, Secretary.

Electrical Measuring Instruments (C39)—

A ballot of the committee on the re-affirmation of C39.1-1938 has been completed. Within the near future the committee will give consideration to the standards for panel instruments and accessories developed during the war.—*J. W. McNair, Secretary.*

Storage Batteries (C40)—

A sectional committee will be organized very soon to act on the revision of American Standard, C40-1928.—*American Institute of Electrical Engineers.*

Definitions of Electrical Terms (C42)

A revision of this American Standard, C42-1941, will probably be initiated in 1946 based on comments and proposals for new definitions which the sponsor has been collecting since the standard was approved in 1941.—*American Institute of Electrical Engineers.*

Rolled Threads for Screw Shells of Electric Sockets and Lamp Bases (C44)—

The committee has been inactive this past year.—*American Society of Mechanical Engineers; National Electrical Manufacturers Association.*

Electric Railway Control Apparatus (C48)—

The sponsor is conducting a canvass of its Committee on Land Transportation to determine whether this American Standard, C48-1931, should be revised or reaffirmed.—*American Institute of Electrical Engineers.*

Rotating Electrical Machinery (C50)

Although there have been no meetings of this sectional committee during 1945, proposals are being discussed by AIEE and NEMA which should lead to a revision of this American Standard, C50-1943, in 1946.—*L. F. Adams, Chairman; E. B. Paxton, Secretary.*

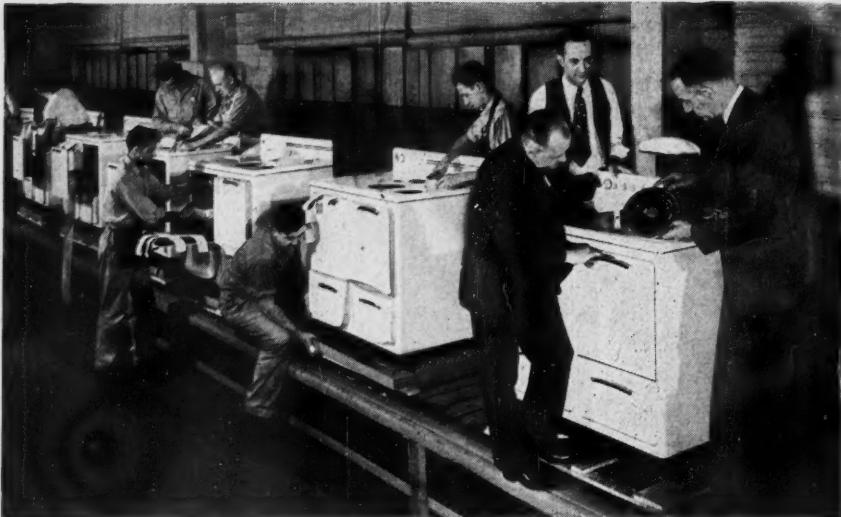
Electrical Welding Apparatus (C52)

Two obsolete American Standards (C52.1-1933 and C52.2-1933) were withdrawn.

Both the Subcommittee on Electric Arc Welding Apparatus and the Subcommittee on Resistance Welding Apparatus of C52 have been reorganized under new chairmen and are actively engaged in the revision of old standards. The Subcommittee on Electric Arc Welding is studying a new NEMA Standard on Arc Welding Apparatus as a basis for an American Standard. The three recently approved American War Standards are being examined by the Subcommittee on Resistance Welding with a view to converting them into American Standards.—*American Welding Society.*

Capacitors (C55)—

A sectional committee is being organized to revise this American Standard, C55-1934, which was originally approved under the Existing Standards Method.—*American Institute of Electrical Engineers.*



The new 1946 household electric ranges are already coming off the production lines, the companies report. The one shown above is a medium price model. In line with this production progress, a first draft of a standard for electric ranges is now being considered. (See C71.)

Transformers (C57)—

Revisions in the American Standards for Transformers, C57.1-1942 through C57.3-1942, have been circulated to the members of the sectional committee for their semi-final letter ballot and comment. At a meeting to be held in December, agreement should be reached on the revised standards which will make it possible for the revised standards to be submitted for approval during the first half of the year 1946.—*V. M. Montsinger, Chairman; E. B. Paxton, Secretary.*

Electrical Insulating Materials (C59)—

The sectional committee held one meeting in March 1945. Three standards which have stood for four or more years without revision were reaffirmed. They include:

Rubber Insulating Tape, ASTM Standard Specifications for (ASTM D 119-38; ASA C59.6-1939)

Rubber Matting for Use Around Electrical Apparatus or Circuits not Exceeding 3000 Volts to Ground, ASTM Standard Specifications for (ASTM D 178-24; ASA C59.4-1935)

Testing Molding Powders Used in Manufacturing Molded Electrical Insulators, ASTM Standard Methods of (ASTM D 392-38; ASA C59.10-1941)

The American Standards Association was also advised of the publication in 1944 and 1945 of tentative revisions applying to the following ASTM standards which have been approved as American Standards:

ASTM Standard Methods of Testing:
Electrical Insulating Oils (ASTM D 117-43; ASA C59.2-1944)

Laminated Round Rods Used in Electrical Insulation (ASTM D 349-42; ASA C59.15-1943)

Laminated Tubes Used in Electrical Insulation (ASTM D 348-42; ASA C59.14-1943)

Sheet and Plate Materials Used in Electrical Insulation (ASTM D 229-43; ASA C59.13-1944)

In September 1945, the sectional committee recommended to the ASA that NEMA Vulcanized Fibre Standards be approved as American Standard and that the ASTM Methods of Testing Shellac Used for Electrical Insulation (D 411-44) be reapproved as American Standards in their revised form.

The proposal that the revised Tentative Methods of Testing Molded Materials Used for Electrical Insulation (D 48-45T) be submitted to the ASA for reapproval in their revised form is now under consideration in a special reviewing committee.

The Standard Methods of Test for Insulation Resistance of Electrical Insulating Materials (ASTM D 257-38; ASA C59.3-1939) were revised by the Society in June 1945, but submittal of the revised methods to the ASA for approval as American Standard has been withheld pending the incorporation of revisions.

The sectional committee is now balloting upon the desirability of submitting the revised ASTM Methods of Test for Impact Resistance of Electrical Insulating Materials (D 256-45T) to the ASA for approval as American Standard. The earlier edition was approved as C59.11-1944.

As a first step in compiling a library of available standards for electrical insulating materials to be deposited in the office of the secretary, the committee plans to bring up to date the List of Available Standards in the Electrical Insulating Field. The intent of this project is the harmonization of duplicate or conflicting specifications to a single standard developed as a national standard.—*American Society for Testing Materials.*

Vacuum Tubes (C60)—

The committee has been reorganized and the first meeting was held in November.—*Dayton Ulrey, Chairman; J. B. Russell, Secretary.*

Electric and Magnetic Magnitudes and Units (C61)—

This committee was organized primarily to serve as an advisory group to the U.S.

National Committee of the International Electro-technical Commission.—*J. W. McNair, Secretary.*

Lightning Arresters (C62)—

No activity has been reported by this committee.—*American Institute of Electrical Engineers.*

Radio-Electrical Coordination (C63)

There has been no activity reported by this committee.—*Radio Manufacturers Association.*

Carbon Brushes (C64)—

Proposals for the revision of this American Standard, C64-1935, are being developed and will be submitted to the sectional committee in the near future.—*National Electrical Manufacturers Association.*

Power-Operated Radio Receiving Appliances (C65)—

There have been no revisions of this standard since its approval in revised form in November 1942.—*Underwriters' Laboratories.*

Preferred Voltages 100 Volts and Under (C67)—

A preliminary report was prepared and a ballot taken on the basis of which a final report for one year's trial use is now being prepared. This should be available in the near future.—*A. C. Monteith, Chairman.*

Sphere Gaps (C68)—

There has been no activity in connection with this project during the past year.—*American Institute of Electrical Engineers.*

Electric Fences (C69)—

Work on this standard was held in abeyance during the war but will be resumed shortly. Some difficulty has been encountered in securing user representation.—*National Bureau of Standards.*

Domestic Electric Flatirons (C70)—

The Domestic Appliance Section of NEMA is actively studying ironing temperatures for the many new textiles introduced during the war with a view to making proposals to the sectional committee.—*National Electrical Manufacturers Association.*

Household Electric Ranges (C71)—

The first draft of the text of this standard has been completed by the chairman, E. C. McCracken. It has been reviewed by the chairman of the Electric Range Technical and General Engineering Committees of NEMA. With the revisions included it has been circulated to the General Engineering Committee of the Electric Range Section of NEMA for comment and approval. As soon as the comments are reviewed by the chairman, they will be brought before the sectional committee.—*National Electrical Manufacturers Association.*

Electric Water Heaters (C72)—

A draft of this standard is in the process of being completed.—*National Electrical Manufacturers Association.*

Attachment Plugs and Receptacles (C73)—

This American Standard, C73-1941, was originally approved under the Existing Standards Method. A canvass is being made among organizations concerned on the question of reaffirmation of the existing standard.—*National Electrical Manufacturers Association.*

Apparatus Bushings (C76)—

Work is going forward in an AIEE committee preparatory to a proposed revision. It will be some time before this is completed.—*Charles Rufus Harte, Chairman; J. W. McNair, Secretary.*

Wet Tests (C77)—

No activity has been reported by this committee.—*Charles Rufus Harte, Chairman; J. W. McNair, Secretary.*

Copper Wire (H4)—

Two meetings were held during the year. Steps have been taken to reaffirm

1945 Officers Re-elected by ESC

The Electrical Standards Committee, coordinating committee for all electrical projects of the American Standards Association, re-elected its 1945 officers to serve for the coming year. They are:

Charles Rufus Harte, American Transit Association, *Chairman*
Sidney Withington, Association of American Railroads, *Vice Chairman*
J. W. McNair, American Standards Association, *Secretary*

standards which have not been revised for three years or longer, as well as some others. They include:

ASTM Standard Specifications for:
Bronze Trolley Wire (ASTM B 9-39; ASA H4.5-1940)
Copper Trolley Wire (ASTM B 47-39; ASA H4.6-1940)
Hard-Drawn Copper Wire (ASTM B 1-40; ASA H4.2-1941)
Medium-Hard-Drawn Copper Wire (ASTM B 2-40; ASA H4.3-1941)

The sectional committee is now balloting upon the proposed submittal to the ASA of the revised Specifications for Soft or Annealed Copper Wire (H4.1) and for Tinned Soft or Annealed Copper Wire for Rubber Insulation (H4.4) for reapproval as American Standards in their revised form.—*American Society for Testing Materials*

Wood Poles (05)—

The seven standards in this series were reaffirmed in May 1945. They include:
Ultimate Fiber Stresses of Wood Poles, 05a-1933

American Standard Specifications and Dimensions for:

Chestnut Poles, 05.3-1941
Douglas Fir Poles, 05.6-1941
Lodgepole Pine Poles, 05.5-1941
Northern White Cedar Poles, 05.1-1941
Southern Pine Poles, 05.4-1941
Western Red Cedar Poles, 05.2-1941

—*ASA Telephone Group.*

Illuminating Engineering Nomenclature and Photometric Standards (Z7)

A revision of this American Standard Z7-1-1942 is being considered.—*Illuminating Engineering Society.*

American War Standards

Specifications for Design and Construction of Resistance Welding Equipment (C52)—

The three American War Standards which were approved this year are:

Controls for Resistance Welding Machines, C52.4-1945
Specification for Resistance Welding Machines, C52.5-1945
Straight and Offset Resistance Welding Electrodes and Electrode Holders, C52.3-1945

The project is now completed.

Methods of Measuring Radio Noise (C63)—

One meeting of the war committee was held during the year, after which a Joint Army-Navy Specification entitled Interference Measurement, Radio, Methods of, 150 Kilocycles to 20 Megacycles (for Components and Complete Assemblies) was issued. Tests are now being conducted to determine whether or not this standard can be adopted as an American War Standard. A Subcommittee on Specifications for Radio Noise Meters has been appointed and will begin its work soon.

Machine Tool Electrical Standards (C74)—

Revision of this American War Standard, C74-1942, will not be completed due to the objections that were raised at the time a letter ballot was circulated. It is expected that proposals for a peacetime project along the same general lines will be made shortly.

Wood Poles (05)—

This war committee was requested by the Office of Price Administration and held its organization meeting in September. A proposed American War Standard, Specifications and Dimensions for Wood Poles Made from Miscellaneous Conifers, O5.7, has been completed and voted upon by the War Committee. It will probably be approved shortly.

New Standards in ASA Library

For the information of ASA Members, the American Standards Association publishes a selected list of standards so they are received by the ASA Library. The list below includes only those standards received recently which the ASA believes are

of greatest interest to Members.

These standards may be consulted by Members at the ASA Library, or copies may be obtained from the organization issuing the standard. The address of the organization is included for convenience in ordering.

Associations and Technical Societies

Aeronautical Chamber of Commerce of America (610 Shoreham Building, Washington, D. C.)

Angles—Equal Leg, Rolled Form Aluminum Alloy NAS 180 Revised June, 1945

Bearing—Heavy Duty Inner and Outer Races, Non-Separable, Single Row Needle NAS 290 Revised June, 1945

Bearing—Heavy Duty, Outer Race Retaining Separable Inner Race, Single Row Needle NAS 291 Revised June, 1945

Bearing—Roller Type, Heavy Section Outer Race and Inner Race Non-Separable, Double Row Needle NAS 293 Revised June, 1945

Bearing—Roller Type, Heavy Section Outer Race and Inner Race Non-Separable, Single Row Needle NAS 292 Revised June, 1945

Bearings—Heavy Duty Self-Aligning, Inner and Outer Races Non-Separable, Single and Double Row Needle NAS 294 Revised June, 1945

Clevis—Rod End for Resistance Welding NAS 171 May, 1945

Pad—Tank Strap NAS 188 May, 1945

The Asphalt Institute (801 Second Avenue, New York 17, N. Y.)

Construction Specifications, Asphalt Priming of Granular Type Base Courses Specification P-1 March, 1945

Manual on Hot-Mix Asphaltic Concrete—includes—Thickness Requirements; Specifications for Hot-Mix, Hot-Laid, Asphaltic Concrete Paving—(Dense Graded Aggregate Type and Graded Aggregate Type); Methods of Testing Mixtures March, 1945

Copper and Brass Research Association (420 Lexington Avenue, New York 17, N. Y.)

Flat Products (With Rolled or Drawn Edges) Standard Edge Contours June, 1945

International Acetylene Association (30 East 42nd Street, New York 17, N. Y.)

Bronze Welding or Brazing of Iron and Steel by the Oxy-Acetylene Process 20¢

The Effect of Flame-Cutting on Steel 25¢ Flame-Hardening by the Oxy-Acetylene Process 20¢

Hard-Facing by the Oxy-Acetylene Process 25¢

Miscellaneous Uses of the Oxy-Acetylene and Air-Acetylene Flames (Revised 1945) 15¢

Oxy-Acetylene Cutting 25¢

Oxy-Acetylene Welding and Its Applications 25¢

Safe Practices for Installation and Operation of Oxy-Acetylene Welding and Cutting Equipment 25¢

Sample Pipe Welding Specifications 10¢

Tests for the Selection of Welding Operators 20¢

Training Oxy-Acetylene Welding and Cutting Operators—Instructor's Outlines—Including Outline Course for Inspectors 25¢

Welding Codes and Specifications 15¢

The Institute of Boiler & Radiator Manufacturers (60 East 42nd Street, New York 17, N. Y.)

Installation Guide, Number 1 One Pipe Forced Circulation Hot Water Heating Systems (For buildings having a heat loss not exceeding 60,000 Btu per hour) January, 1945 25¢

Testing and Rating Code (For Low Pressure Heating Boilers) Third Edition, July, 1945 \$1.00

Metal Cutting Tool Institute (410 Asylum Street, Hartford 3, Conn.)

Taps and Dies, Commercial Standards for Revised April, 1945 (Supersedes all previous copies of the pamphlet)

National Electrical Manufacturers Association (155 East 44 Street, New York 17, N. Y.)

Distribution Transformers—Single Phase Pole Type—100 Kva and Smaller, 15,000 Volts and Below, Second Report, Revised April, 1945 (A Report of the Joint Committee of the Edison Electric Institute and National Electrical Manufacturers Association on Standards for distribution Transformers) Pub No. 111 60¢

Electric Arc-Welding Machine and Electrode Standards Pub No. 45-105 (Supersedes Pub No. 42-81) September, 1945 75¢

Electric Water Heaters, NEMA Standards for, Publication No. 45-104 May, 1945 25¢

Specifying a Direct-Connected Steam Turbine, Synchronous Generator Unit (Approved as Authorized Engineering Information) Publication No. 45-103 May, 1945 50¢

Explosion-Type Distribution Lightning Arresters, Standards for Pub No. 45-95 August, 1945 75¢

Home Freezer Standards Pub No. 45-106 September, 1945 25¢

Industrial Control, Standards for Pub No. 45-97 September, 1945 \$1.50

Motor Generator Standards Pub No. 45-102 (Supersedes Pub No. 41-64) June, 1945 \$4.00

Shunt Capacitors, Standards for Pub No. 45-100 August, 1945 75¢

National Fire Protection Association (60 Batterymarch Street, Boston 10, Mass.)

Airplane Crash Fire Fighting Manual Society of Automotive Engineers, Inc (29 West 39 Street, New York 18, N. Y.)

Aeronautical Material Specifications 17 new specifications and 29 revisions of former specifications. Issued as of October 1, 1945.

Society of Automotive Engineers, Inc (29 West 39th Street, New York 18, N. Y.)

Aluminum Alloy Castings, Die, 9.5 Si .5 Mg AMS 4290B (Revised)

Permanent Mold

4.5 Copper 2.5 Silicon Solution (B195-T4) AMS 4283

4.5 Copper 2.5 Silicon Solution and Precipitation (B195-T6) AMS 4284B (Revised)

5 Silicon Solution and Overaged (355-T71) AMS 4280B (Revised)

5 Silicon Solution and Precipitation (355-T6) AMS 4281

7 Silicon Solution and Precipitation (356-T6) AMS 4284A (Revised)

Brass Sheet and Strip, Half Hard AMS 4507

Brass Wire

Annealed AMS 4712

1/8 Hard AMS 4713

Flux, Brazing (Silver) AMS 3410A (Revised)

Naval Brass, Rods and Bars—Hard AMS 4612A (Revised)

Steel

.55 Ni .5 Cr .25 Mo (.38-.43C) Heat Treated (105,000 TS) AMS 6325B (Revised)

.55 Ni .5 Cr .25 Mo (.38-.43C) Heat Treated (125,000 TS) AMS 6327B (Revised)

1.8 Ni .25 Mo (.38-.43C) Heat Treated (105,000 TS) AMS 6315B (Revised)

1.8 Ni .25 Mo (.38-.43C) Heat Treated (125,000 TS) AMS 6317B (Revised)

Steel-Carburizing, 3.5 Ni 1.5 Cr (.14-.20C) AMS 6254E (Revised)

Steel, Corrosion Resistant 13 Chromium (Low Carbon) Hardenable, Free Machining AMS 5610 (Revised)

13 Chromium (Medium Carbon) Hardenable, Free Machining AMS 5620

Steel, Nitriding, 3.5 Ni 1.2 Cr .25 Mo 15 Al AMS 6475

Steel Sheet and Strip Forming, Low Carbon AMS 5042C (Revised)

Steel Sheet and Strip (Continued)—

Low Carbon—Hard Temper—AMS 5045
Steel Tubing (Seamless)
1.45 Chromium (0.95-1.10C) AMS 6441
Round
.95 Cr .20 Mo (.27-33C) AMS 6360B (Revised)
.95 Cr .20 Mo (.33-38C) AMS 6365A (Revised)
.55 Ni .5 Cr .2 Mo (.27-33C) AMS 6530B (Revised)
.55 Ni .5 Cr .25 Mo (.33-38C) AMS 6535B (Revised)
Steel Tubing (Welded)
.95 Cr .20 Mo (.27-33C) AMS 6510A (Revised)
.55 Ni .5 Cr .2 Mo (.27-33C) AMS 6550B (Revised)
Synthetic Rubber
Buna S Type
(35-45) AMS 3245
(45-55) AMS 3246
(55-65) AMS 3247
Hot Oil and Coolant Resistant—Low
Swell
(45-55) AMS 3226B (Revised)
(55-65) AMS 3227B (Revised)
(65-75) AMS 3228B (Revised)
Hot Oil Resistant—High Swell
(45-55) AMS 3222B (Revised)
(55-65) AMS 3223B (Revised)
Hot Oil Resistant—Low Swell
(75-85) AMS 3229B (Revised)
Hydraulic Fluid (Petroleum Base) (Resistant)
(55-65) AMS 3200B (Revised)
Tolerances
Alloy Steel Sheet and Strip AMS 2252
Aluminum and Aluminum Alloy Tubing
AMS 2203
Carbon Steel Sheet and Strip AMS 2232
Copper and Copper Alloy Plate, Sheet
and Strip AMS 2222
Copper and Copper Alloy Rods and
Bars AMS 2221
Copper and Copper Alloy Wire AMS
2224
Magnesium Alloy Bar, Rod and Shapes
AMS 2211
Magnesium Alloy Sheet AMS 2212
The Tire & Rim Association, Inc
(2001 First-Central Tower, Akron 8,
Ohio)
1945 Airplane Handbook July, 1945
\$1.00

U. S. Government

(Wherever a price is indicated, the publication may be secured from the Superintendent of Documents, Government Printing Office, Washington, D. C. In other cases, copies may be obtained from the government agency concerned.)

Army Air Force

Material and Process Specifications Bulletin No. 23, September, 1945
Material and Process Specifications Bulletin No. 23, October, 1945

Federal Specifications Executive Committee (U. S. Treasury Department, Washington, D. C.)

Federal Specifications are prepared for use by all government departments and establishments in their purchases. Copies are available from the Superintendent of

Documents, Government Printing Office, Washington 25, D. C., at 5 cents each. Requests should be accompanied by cash, check, or money order.

As a service to Company Members, the ASA maintains a sale file of all Federal Specifications. These specifications can be purchased from the ASA Sales Department.

Federal Specifications

Abbreviations:—emer alt—emergency alternate; fed spec—federal specification
Biscuit and Short-Bread-Mixtures; Prepared (Amendment 1) N-B-371 August 15, 1945

Blasting-Apparatus (Machines, Blasting; Galvanometers and Rheostats for Testing Blasting Circuits and Machines) (Amendment 2) W-B-411 September 1, 1945

Bronze, Manganese, and Manganese-Aluminum; Ingots (For Remelting) (Superseding Fed Spec QQ-B-731a) QQ-B-731b August 1, 1945

Bronze, Manganese; Casting (Including Manganese-Aluminum Bronze) (Amendment 2) QQ-B-726c July 15, 1945

Brushes, Dust; Painters', Flat (Amendment 3) H-B-211 August 15, 1945

Brushes; Glue, Flat (Amendment 1) H-B-291a August 1, 1945

Brushes; Glue, Round (Amendment 1) H-B-301a August 1, 1945

Brushes, Paint; Metal-Bound, Flat (Utility-Wall) (Amendment 3) H-B-436 August 15, 1945

Brushes, Roof; Knotted-Style, Three Knots (Amendment 4) H-B-471 August 15, 1945

Brushes, Scrubbing; Floor, Hand (Superseding Amendment 2 and Emer Alt E-H-B-541, 5-7-43) (Amendment 3) H-B-541 August 1, 1945

Coupling; Hose, Garden and Water (Superseding Emer Alt E-WW-C-623a, 10-29-42) (Amendment 1) WW-C-623a August 1, 1945

Fire-Extinguishing-Liquid; Carbon-Tetrachloride Base (Amendment 1) O-F-380a August 15, 1945

Gold; Foil, Cylinders (For Dental-Fillings) (new) QQ-G-545 July 15, 1945

Gold; Plate (For Crowns and Bridges) Dental (new) QQ-G-550 July 15, 1945

Handles, Hickory; Striking-Tool (Amendment 2) NN-H-93 August 15, 1945

Lamp Auxiliaries; Fluorescent (Amendment 1) W-L-131 July 15, 1945

Lampholders (Sockets); Medium-Screw-Shell, General Service (new) W-L-142 July 15, 1945

Lamps; Electric, Incandescent, Large, Tungsten-Filament 1943 Supplement (Amendment 3) W-L-101e August 15, 1945

Lamps; Electric, Incandescent, Miniature, Tungsten-Filament 1945 Supplement (Amendment 1) W-L-111b September 1, 1945

Leather; Sole (Cut, Outer, and Top-Lift), Vegetable-Tanned, Factory (Superseding Emer Alt E-KK-L-261b, 9-5-42) (Amendment) KK-L-261b August 15, 1945

Mallets and Mauls; Wood (Amendment 4) LLL-M-71 August 1, 1945

Mineral-Wool, Impregnated; Blanket, Block, and Pipe-Covering (Molded) (For Low Temperatures) (Superseding Fed Spec HH-M-371, and Emer Alt Fed Spec E-HH-M-371, 6-10-42) HH-M-371a August 15, 1945

Mirrors; Laryngeal (new) GG-M-416 August 15, 1945

Orange-Juice; Canned (new) Z-O-666 July 15, 1945

Packing; Metallic, Flexible (Superseding Fed Spec HH-P-126a, 3-7-33) HH-P-126b September 1, 1945

Paint; Resin-Base Emulsion, Interior, Paste, White and Tints (Superseding TT-P-88) TT-P-88a August 1, 1945

Paint; Stencil, Flat (new) TT-P-98 August 1, 1945

Paint; Traffic, Exterior, White and Yellow (Superseding E-TT-P-115, 8-28-42) (Amendment 1) TT-P-115 August 1, 1945

Pans, Bake and Roasting; Steel (Amendment 2) RR-P-55 August 1, 1945

Pipe; Steel and Ferrous Alloy (For Bending, Flanging, Etc (Iron-Pipe Size)) (Amendment 1) WW-P-404 August 15, 1945

Pipe; Steel and Ferrous Alloy (For Ordinary Uses (Iron-Pipe Size)) (Amendment 1) WW-P-406 August 15, 1945

Plaster; Gypsum (Superseding SS-G-901, and SS-P-401) SS-P-402 July 15, 1945

Rope; Wire (Superseding Fed Spec RR-R-571) RR-R-571a July 15, 1945

Sheeting; Cotton, Bleached, Wide (Amendment 1) CCC-S-271a August 1, 1945

Sheeting; Cotton, Unbleached, Wide (Amendment 1) CCC-291a July 15, 1945

Splints; Wire-Ladder (Medical and Surgical use) (new) GG-S-36 July 15, 1945

Stoppers; Rubber (Amendment 1) ZZ-S-751 July 15, 1945

Straightedges; Steel (Draftsmen's) (Superseding Fed Spec GG-S-776 and Emer Alt E-GG-S-776, 9-2-42) GG-S-776a September 1, 1945

Testers; Antifreeze-Solutions (Amendment 1) GG-T-241 July 15, 1945

Tile; Floor, Rubber (Superseding Emer Alt E-ZZ-T-301, 3-27-42) (Amendment 1) ZZ-T-301 August 15, 1945

Tourneques; Braided-Line, Spanish-Windlass-Type (new) GG-T-598 July 15, 1945

Valves, Cast-Iron, Gate; 125- and 250-Pound, Screwed and Flanged (For Land Use) (Superseding part of WW-V-76b, and part of Emer Alt E-WW-V-76b, 4-1-42) WW-V-58 July 15, 1945

Webbing; Elastic (new) JJ-W-155 August 1, 1945

White-Lead; Basic-Carbonate, Dry, Paste-In-Oil, and Semipaste Containing Volatile Thinner (Superseding Fed Spec TT-W-251a, 11-6-34) TT-W-251b August 1, 1945

Wrenches, Bolt and Nut; Nonadjustable (Open-End-and Box) (Amendment 1) GGG-W-636 August 1, 1945

Joint Army-Navy Specifications

(Approved by the War and Navy Departments for use of procurement services of the Army and the Navy)

Plastic-Materials, Molded, Thermosetting—JAN-P-14; Army Number 61-14; Navy Number 1794a; August, 1945

Reels and Reel Containers; 16-mm Motion Picture Projection—JAN-R-214; Army Number 75-473; Navy Number 18R4; May, 1945

Strainers, Gasoline (For Ship Gasoline Systems)—JAN-S-240; Army Number 65-16; Navy Number 66S1; July, 1945

**National Bureau of Standards
(Washington 25, D.C.)**

Commercial Standards

List of Commercial Standards Revised October, 1945
Tank-Mounted Air Compressors CS126-45 10¢ (Effective December, 1945)

Simplified Practice Recommendations

Clay Sewer Pipe and Fittings R211-45 10¢
Peanut Butter Packages and Containers R209-45 5¢
Crayons, Chalks, and Related Art Materials for School Use (Types, Sizes, Packaging, and Colors) R192-45 5¢
Milk Shipping Cans R208-45 5¢
Pipes, Ducts, and Fittings for Warm-Air Heating and Air Conditioning R207-45 10¢

**Office of Marketing Services
(Department of Agriculture, Washington 25, D.C.)**

Check List of Standards for Farm Products July, 1945

**U. S. Department of Agriculture
War Food Administration
Office of Marketing Services
(Washington 25, D.C.)**

Bunched Carrots July, 1945
Cabbage September, 1945
Carrot With Short-Trimmed Tops July, 1945
Dried Fruits June, 1945
Frozen Apricots June, 1945
Frozen Brussels Sprouts June, 1945
Frozen Peaches June, 1945
Purchasing Processed Fruits & Vegetables Misc. Pub No. 565 May, 1945
Shelled Runner Peanuts August, 1945
Topped Carrots July, 1945

**U. S. Department of Labor
Division of Labor Standards
(Washington 25, D.C.)**

Controlling Chemical Hazards, Series No. 1, Ammonia, 1945
Purchase and Preservation of Forest Products, Standard Recommendations for (New salt preservatives added)
Round Forest Products, Tentative Standard Volumes of 14¢

Mimeographed copies of proposed Simplified Practice Recommendations and proposed revisions may be obtained from the Division of Simplified Practice, National Bureau of Standards, Washington 25, D.C. —Upon promulgation they can be bought at the prices indicated from the Superintendent of Documents, Government Printing Office, Washington 25, D.C.

types of these valves, made of steel, iron, and bronze.

If this recommendation is approved it will retain on a voluntary basis the simplified practice features of a mandatory order which was effective during the war emergency.

Clay Sewer Pipe and Fittings, R211-45

Printed copies of this Simplified Practice Recommendation are now available, according to an announcement of the National Bureau of Standards. This recommendation lists the variety of standard-strength and extra-strength pipe and fittings to be considered as stock items. The number of varieties amounts, roughly, to one-third of the 1,500 to 1,600 items formerly carried by the industry. The price is 10 cents.

Fine and Wrapping Paper (Basic Weight Numbers and Weight Calculations)

A voluntary Simplified Practice Recommendation for Fine and Wrapping Paper, based on a report of the National Paper Trade Association, has been submitted to producers, distributors, and users for their acceptance or comment.

Hard Edge, Flexible Back, Metal Cutting Band Saws

The National Bureau of Standards has submitted this recommendation to producers, distributors, and users for their approval. If accepted it would mean the establishment of a voluntary simplified list of regular type and skip-tooth type of hard edge, flexible back, metal cutting band saws.

Paints, Varnishes, and Related Products (Shades and Containers), R144-43, Revision of—

A proposed revision of Simplified Practice Recommendation R144-43, Paints, Varnishes, and Related Products has been confirmed for promulgation and will be identified as R144-45.

This revision supersedes the war emergency revision of 1943, the purpose of which was to enable the industry to contribute to the war effort by a reduction of 33 percent in the number of colors used for various products and by permitting substitute materials for containers.

In attempting to adapt this recommendation to the postwar needs of consumers, the current revision increases the number of colors for some products, adds small sizes and a 2-gallon size container for certain items and eliminates portions of the text of the previous issue which were essential to the emergency program.

Until printed copies of R144-45 are available, mimeographed copies may be obtained upon request.

NBS Acts on Standards and Simplified Practice Recommendations

Commercial Standards

**Announced by the Division of Trade Practice,
National Bureau of Standards**

Sizing of Apparel—Boys, Proposed Commercial Standard TS-4007—

The Mail Order Association of America has submitted to the National Bureau of Standards a proposed Commercial Standard on Body Measurements for the Sizing of Apparel for Boys, TS-4007. Its primary purpose is to establish a system of body measurements as a basis for the sizing of boys' apparel. If this system were adopted, body measurements of the boy (rather than his age) would determine the size. It would serve as guidance for those engaged in producing, or preparing specifications for, ready-to-wear garments and patterns. Diversity of size markings for corresponding measurements in this classification could be eliminated. Another purpose of the standard is to establish standard inseam and outseam, and true rise measurements, for slacks.

This proposal is the third of a coordinated series which covered the infants' to children's and the girls' classifications

previously. It has been submitted to interested groups for comment and suggestion.

Vaporizing Pot-Type Furnaces, Commercial Standard (Emergency) CS(E)104-43, Recommended Revision of—

On recommendations from various sources, and with the endorsement of the Standing Committee of the National Bureau of Standards, a recommended revision of CS(E)104-43 for Warm-Air Furnaces Equipped With Vaporizing Pot-Type Oil Burners, has been submitted to producers, distributors, and users for written acceptance prior to publication of the standard.

Mimeographed copies of proposed Commercial Standards and proposed revisions may be obtained upon request from the Division of Trade Practice, National Bureau of Standards, Washington 25, D.C.

Simplified Practice Recommendations

**Announced by the Division of Simplified Practice,
National Bureau of Standards**

Automatic Regulating Valves—

A proposed Simplified Practice Recommendation for Automatic Regulating Valves has been submitted to producers,

distributors, and users for approval or comment. Its purpose is to establish as a useful standard of practice a simplified list of pressure ratings and sizes of seven

ASA Standard Activities

American Standards

American Standards Available Since Our November Issue

For American Standards published during the last month, see page 287.

American Standards Approved Since Our November Issue

Automatic Station Control, Supervisory and Telemetering Equipments, C37.2-1945 (Revision of C37.2-1937)

Sponsor: Electrical Standards Committee

Gas-Burning Appliances:

Approval Requirements for Domestic Gas Ranges, Z21.1-1945 (Revision of Z21.1-1942)

Approval Requirements for Gas Water Heaters, Z21.10-1945 (Revision of Z21.10-1944)

Approval Requirements for Gas Space Heaters, Z21.11-1945 (Revision of Z21.11-1942)

Approval Requirements for Central Heating Gas Appliances, Z21.13-1945 (Revision of Z21.13-1943)

Listing Requirements for Low Water Cut-off Devices, Z21.35-1945

Sponsor: American Gas Association

Prevention of Dust Explosions:

Installation of Pulverized Coal Systems, Z12.1-1945 (Revision of Z12.1-1942)

Explosion and Fire Protection in Plants Producing or Handling Magnesium Powder or Dust, Z12.15-1945 (Revision of Z12.11-1942)

Prevention of Dust Explosion Hazards in the Plastics Industry, Z12.16-1945

Sponsor: National Fire Protection Association

American Standards Reaffirmed Since Our November Issue

Industrial Accident Prevention Signs, Specifications for, Z35.1-1941 Reaffirmed 1945

Sponsor: National Safety Council Bronze Trolley Wire, Specifications for (ASTM B 47-39; ASA H4.5-1940) Reaffirmed 1945

American Standards Reaffirmed (Continued)

Copper Trolley Wire, Specifications for (ASTM B 49-39; ASA H4.6-1940) Reaffirmed 1945

Hard-Drawn Copper Wire, Specifications for (ASTM B 1-40; ASA H4.2-1941) Reaffirmed 1945

Medium-Hard-Drawn Copper Wire, Specifications for (ASTM B 2-40; ASA H4.3-1941) Reaffirmed 1945

Molding Powders Used in Manufacturing Molded Electrical Insulators, Methods of Testing (ASTM D 293-38; ASA C59.10-1941) Reaffirmed 1945

Rubber Insulating Tape, Specifications for (ASTM D 119-38; ASA C59.6-1939) Reaffirmed 1945

Rubber Matting for Use Around Electrical Apparatus or Circuits not Exceeding 3000 Volts to Ground (ASTM D 178-24; ASA C59.4-1935) Reaffirmed 1945

Sponsor: American Society for Testing Materials

Standards Being Considered by ASA for Approval

Pipe Threads (Revision of B2.1-1942)

Sponsors: American Gas Association; American Society of Mechanical Engineers

Standards Submitted to ASA for Approval

Drawings and Drafting Room Practice, Z14.1 (Proposed revision of Z14.1-1935)

Sponsors: American Society of Mechanical Engineers; Society for the Promotion of Engineering Education

Gear Inspection and Tolerances, B6

Sponsors: American Gear Manufacturers Association; American Society of Mechanical Engineers

New Project Requested

Standardization of Incandescent and Electric Discharge Lamps

American War Standards

American War Standards Available

For new American War Standards available during the past month, see page 287.

American War Standards Approved

Registration Distance and Lens Mounting Dimensions for 35-mm Motion Picture Cameras, Specification for, Z52.70-1945

Wood Poles—Miscellaneous Conifers, Specifications and Dimensions for, O5.7-1945

War Standards Under Way

Allowable Concentration of Trichloroethylene, Z37

American War Standards Under Way (Continued)—

Registration Distance and Mounting Dimensions of 16-mm Motion Picture Camera Lenses, Z52.50

Motion Picture Projection Equipment Class II Service Model 16-mm Sound Motion Picture Projection Equipment, Specification for, Z52.13

Motion Picture Release Prints

Leaders and Trailers for 16-mm Sound Motion Picture Release Prints Made from 16-mm Original Material, Z52.31

Printer Loss in 16-mm Sound Motion Picture Prints, Method of Determining, Z52.40

Motion Picture Test Films

Warble Test Film Used for Testing 16-mm Sound Motion Picture Equipment, Specification for, Z52.32

Still Cameras

Exposure Markings for Between-the-Lens Shutters, Z52.62

Exposure Markings for Focal Plane Shutters, Z52.64

Exposure Time of Focal Plane Shutters, Method of Determining, Z52.65

Performance Characteristics of Between-the-Lens Shutters, Method of Determining, Z52.63

Still Printing Equipment

Enlarger, Photographic, Specification for, Z52.23

Radio Noise, Methods of Measuring, C63 Safety Code for the Industrial Use of X-Rays

Electrical Protection, Part VI

Methods and Materials of X-Ray Protection, Part III

Specific Applications for 400 Kv and Lower, Part IV

Specific Applications of One and Two Millions, Part V

Use and Storage of Radium in the Field of Industrial Radiography, Part II

Screw Threads, B1

Buttress Threads

High-Duty Studs in Light Alloys

Instrument Threads

Stub Acme Threads

Unification of Screw Threads

Women's Industrial Clothing

Jackets for Outdoor Wear (Slide-Fastener Closure), L17.6

Jackets for Outdoor Wear (Fly-Type Button Closure), L17.5

Wood Poles, O5

Ultimate Fiber Stresses of Wood Poles, O5aWS

Reprint Tells Story of Underwriters' Labels

The story of Underwriters' Laboratories, Inc., and its testing and labeling program, published early this year in the *Saturday Evening Post*, has been reprinted by the National Fire Protection Association. Copies of the reprint can be obtained from the NFPA, 60 Batterymarch Street, Boston 10, Mass.

News About ASA Projects

Drawings and Drafting Room Practice, Z14—

Sponsors: American Society of Mechanical Engineers; Society for the Promotion of Engineering Education

A proposed revision of the American Standard approved in 1935 has been submitted by the sponsors to the American Standards Association for approval. In preparing the 1935 edition, the sectional committee limited its work to the material on which there was complete agreement among the members of the committee. During the nine years in which the standard has been in existence, some 35,000 copies have been distributed. The only adverse comment during that time, the sponsors state, has been the demand for a more detailed treatment. To meet this demand, the committee has now expanded the standard from 24 pages to 54 pages. The revised standard is now before the Board of Examination for recommendation to Standards Council.

Gear Inspection and Tolerances, B6—

Sponsors: American Gear Manufacturers Association; American Society of Mechanical Engineers.

A proposed new American Standard for Gear Tolerances and Inspection has been submitted by the sponsors to the American Standards Association for approval. The standard covers the tolerances and inspection of spur, helical, bevel, and hypoid gears, and backlash in gears.

Standardization of Incandescent and Electric Discharge Lamps—

A suggestion that the American Standards Association organize a project for the standardization of incandescent and electric discharge lamps has been received. The letter requesting the project declared:

"From the standpoint of the public it is very desirable that lamps of the same general description should fit in the same sockets interchangeably and operate there satisfactorily. This means that essential dimensions should be established and where accessories are required the lamps of different manufacturers should be so designed as to operate satisfactorily from the same accessory. Today there is a considerable number of manufacturers of lamps of one or more types and there is no correlation between these manufacturers as regards standardization."

Zinc Coating of Iron and Steel, G8—

Sponsor: American Society for Testing Materials.

The sponsor has circularized all the member organizations represented on Sectional Committee G8 as a result of suggestions that the committee be disbanded and the work turned over to ASTM Committee A-5 on Corrosion of Iron and Steel. Most of the members of committee G8 are also members of Committee A-5. If desirable, the ASTM declares, arrangements can be made to increase the personnel to include those organizations that are members of G8 that are not now

members of A-5. The member groups were unanimous in approving the discontinuation of the committee. In view of this, on the recommendation of the ASTM Administrative Committee on Standards, the ASTM as sponsor of sectional committee G8 is recommending to the American Standards Association that the sectional committee be discontinued and the responsibility for reviewing any standards dealing with zinc coatings of iron and steel that are recommended for submittal to the American Standards Association be referred to ASTM Committee A-5.

Standardization in the Field of Motion Pictures, Z22—

Sponsor: Society of Motion Picture Engineers.

The Sectional Committee on Standardization in the Field of Motion Pictures is

voting on whether to recommend 16 American War Standards for cinematography for approval as American Standards.

Photography and Cinematography, Z52—

The War Committee is voting on approval of proposed American War Standards for Direct Finder Aperture for 35-mm Motion Picture Cameras, Z52.68; for Auxiliary Finder Aperture for 35-mm Motion Picture Cameras, Z52.69; and for Leaders and Trailers for 16-mm Sound Motion Picture Release Prints Made from 16-mm Original Material, Z52.31.

Allowable Concentration of Trichloroethylene, Z37—

A second draft of the proposed American War Standard Allowable Concentration of Trichloroethylene, Z37.19, is now being circulated for criticism.

New ASTM Committee Proposed on Methods of Testing Building Materials

ORGANIZATION of a Committee on Methods of Testing Building Constructions was recommended to the Executive Committee of the American Society for Testing Materials by the Society's Administrative Committee on Simulated Service Testing at the committee's second meeting on September 27, 1945.

The recommendation was made as the result of the committee's study of the need for developing methods of test for building construction. These are required, it is reported, not only for prefabricated building units but for the more conventional types of erected-on-site construction. At a meeting of representatives of the building industry held at the National Bureau of Standards, it was established that in order to assure better service in building construction it is necessary to take into consideration three primary elements: (1) materials; (2) engineering design; and (3) fabrication details. The meeting showed that methods of test for evaluating all of these would be welcomed by code officials, architects, and others in the building industry.

As a result of this meeting the Administrative Committee voted to recommend that the proposed Committee on Methods of Testing Building Construction be set up with the following scope of activities:

To formulate methods of test for building constructions, including elements, con-

nctions, and assemblies, under actual or simulated service conditions, applicable to the evaluation of such factors as materials, design, construction, and fabrication.

The Administrative Committee is further recommending to the Executive Committee that L. J. Markwardt of the Forest Products Laboratory in Madison, Wisconsin, be designated as temporary chairman to organize the committee and that J. H. Courtney of the American Standards Association be designated temporary secretary to serve with him.

A second important step taken at the meeting of the Administrative Committee on Simulated Service Testing was a recommendation to the American Society for Testing Materials that the Society's present Research Committee on Fatigue of Metals be reconstituted as a Committee on Fatigue. The scope being recommended for this committee is as follows:

To formulate methods for the determination of fatigue characteristics of simple and composite materials, components, and processed parts, and to promote research in these fields.

It is proposed that the present Research Committee be continued as a subcommittee activity. R. E. Peterson of the Westinghouse Electric Corporation has been named to serve as temporary chairman of this reorganized committee in its new capacity as a subcommittee.

REVISED METHODS FOR ACCIDENT STATISTICS, IMPORTANT NEW BUILDING STANDARDS AVAILABLE

TWO standards that start a new series in the building field, to provide a basis for the coordination of dimensions of all building materials and equipment, are available among the standards published this month. One of these two standards states the principles of the basis of coordination for the entire field of building materials and equipment; the other states the basis for the coordination of one material—masonry. Two other standards, in the regular building code series, are the important new Building Code Requirements for Minimum Design Loads in Buildings and Other Structures, and the revised Build-

ing Code Requirements for Reinforced Gypsum Concrete.

Safety engineers, state and federal agencies concerned with accident prevention, and insurance groups, will all be interested in the enlarged and more comprehensive edition of the American Standard Method of Compiling Industrial Injury Rates, the revision of which is now available.

Three new photographic standards apply standardization in the photographic field to thickness of photographic paper, picture and sound synchronization marks, and filter terminology and nomenclature.

American Standards Association

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.....	A62.2-1945		Coordination of Masonry, Basis for the25
.....	C37.2-1945		Automatic Station Control, Supervisory and Telemetering Equipments40
.....	O5.7-1945		Specifications and Dimensions for Wood Poles—Miscellaneous Conifers (American War Standard)30
.....	Z16.1-1945		Method of Compiling Industrial Injury Rates20
.....	Z38.1.44-1944		Designation for Thickness of Photographic Paper10
.....	Z38.8.6		Practice for Photographic Processing Manipulation of Paper (Proposed American Standard)30
.....	Z52.53-1945		Picture and Sound Synchronization Marks for 35-mm and 16-mm Sound Motion Picture Release Negatives and Other Preprint Material (American War Standard)20
.....	Z52.61-1945		Photographic Filter Terminology and Nomenclature (American War Standard)25
.....	Z52.70-1945		Registration Distance and Lens-Mounting Dimensions for 35-Mm Motion Picture Cameras (American War Standard)10

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one free copy of each newly approved American Standard for the first \$50 of annual membership, and an additional copy for each \$100 beyond this. These standards can be obtained through your company representative. We will be glad to give you his name, if necessary.



Left: A recent installation of outdoor oil circuit breakers of the conventional tank type. The standards also cover circuit breakers using liquids other than oil, and air circuit breakers.

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